Australasian Soil and Plant Analysis Council Inc.

ASPAC Plant Proficiency Testing Program Report

2022

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Foreword

This is the latest of ASPAC's many inter-laboratory proficiency program (ILPP) reports for plants since 1994. This reporting format for plants has applied since ASPAC's 2004-05 annual program (see Rayment *et al*. 2007)[1]. The ILPPs for plant tissue chemical tests have three "rounds" each of four carefully prepared samples. Similar annual programs for soil samples operate concurrently (e.g., Lyons *et al.*2013)[2].

This ILPP continued ASPAC's Australasian focus and targeted laboratories in the private, government and university sectors that provide soil testing services for a range of purposes. These mostly locate in Australia, New Zealand, Oceania, and in parts of South-east Asia.

The Service Provider for ASPAC is Global Proficiency Ltd. This company operates mainly out of New Zealand, with key personnel and contact details provided on page iv.

Technical aspects of this ILPP were specified and over-sighted by ASPAC's Laboratory Proficiency Committee (LPC), recent membership of which is listed on page iv. In addition, LPC members and two key personnel from the Service Provider participate annually in a Technical Advisory Group (TAG), chaired by a senior representative of the Service Provider.

The ASPAC-LPC and the ASPAC Executive Committee also appreciate the efforts made by laboratories who utilized this method-specific proficiency program. By participating, they share a commitment to and responsibility for perceived measurement quality across Australasia, noting that proficiency in measurement is only a component of laboratory accreditation to Australian Standard AS ISO/IEC 17025:2018, and New Zealand Standard NZS ISO/IEC 17025:2018, which should be an achievement goal for laboratory managers.

An electronic copy of this report, and other similar completed annual program reports, can be downloaded from ASPAC's public web site at www.aspac-australasia.com.

Dr Roger Hill
ASPAC-LPC Convenor

1 Rayment, G.E., Peverill, K.I., Hill, R.J., Daly, B.K., Ingram, C. and Marsh, J. (2007). ASPAC Soil Proficiency Testing Program Report 2004-05. (73 + vi pp.) ASPAC, Melbourne, Victoria.

2 Lyons, D.J., Rayment, G.E., Daly, B.K., Hill, R.J., Ingram, C. and Marsh, J. (2013). "ASPAC Plant Proficiency Testing Program Report 2008-09". (47 + vi pp.) ASPAC, Melbourne, Victoria.

Acknowledgements

Those commissioned by GPL to prepare plant samples and confirm homogeneity prior to circulation for proficiency testing purposes [Department of Environment and Science (DES) Queensland, Australia] are acknowledged, as are operational staff of GPL.

Membership of ASPAC Laboratory Proficiency Committee in 2022

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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 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

1. Introduction

This not-for-profit, annual ASPAC Plant Proficiency Testing Program Report for 2022 documents program methodology, summary statistics, and a full listing of results by test for three "rounds" of plant tissue chemical testing. For historical details on earlier annual plant ILPP's undertaken by ASPAC, refer to Rayment *et al*. (2007) referenced earlier in this report. These reports are also available for downloading from ASPAC's public web site at *www.aspac-australasia.com.*

The report includes an outline of how ASPAC now confers performance-based, method-specific certification to laboratories that regularly participate. To respect confidentiality, the cross-reference between laboratory name and laboratory identification number is not included. However, laboratories certified as proficient for specific tests in this annual program were documented at the time on ASPAC's public website.

2. Program Details

2.1 Responsibilities

GPL- see page iv -under its "PlantChek" arrangements, was contracted by ASPAC as the soil ILPP provider for 2022. Accordingly, GPL had responsibility on a "round-by-round" basis for sourcing and preparation of samples, for ensuring the samples met international and/or within-country quarantine requirements, and for the timely supply of samples to participating laboratories. GPL also undertook data analysis and "round-by-round" reporting for ASPAC and assembled the summary and "raw" data provided in Section 3 and Appendix 4, respectively, of this report.

ASPAC's LPC- see page iv- had responsibility to implement and resolve matters of policy and to provide guidance on technical matters specific to soil chemical testing both to GPL and to laboratory participants. The LPC also undertook occasional checks and audits for quality control purposes, participated in the earlier mentioned TAG, contributed to training workshops, and assisted (on request) laboratory managers with technical aspects on measurement improvement. As always, laboratory managers were encouraged to seek help from ASPAC when shown to be operating at levels of measurement performance below their peers.

Participants receive or have a unique, confidential laboratory number, subsequently used to identify the origin of each result presented in program reports and lists of results. This identification number has typically been carried forward from one annual program to the next, but code numbers changed in 2014-15 and beyond.

ASPAC's web-site manager and others updated the public web site with details on method-specific certifications and lists of laboratories that undertook those soil tests. The proficiency data used was supplied by GPL and oversighted by the Convener of the ASPAC-LPC.

2.2 Plant program participation

Some 39 laboratories submitted results for at least one plant test in 2022. Names and other summary contact details for the participants are provided in Appendix 1. There were 30 laboratories involved from Australia, a decrease of 1 from 2021 (QLD=8; VIC=6; NSW=6; WA=5, SA=3; TAS=1; ACT=1), 6 from New Zealand (no change), and 3 from Asia and the South Pacific (Fiji, Papua New Guinea and United Arab Emirates).

2.3 Tests and round participation

Three proficiency rounds for testing plant materials were offered in 2022, each comprising of four samples. The participation for each round is listed in Table 1. Participants are not required to submit results for every one of these tests. Laboratories are invited to analyse each sample supplied using the methods they normally employ, on the assumption that all results were reported on a 65°C oven-dry basis, not on an "as received" basis.

Excluding Nitrate Nitrogen, all tests listed in Table 1 are assumed to be "total" element concentrations in the plant material however results for Al, Fe and Si may only reflect acid-digestible concentrations and underestimate their composition. The analytical methods used are not described in detail in this report, however method-indicating codes are summarized in Tables 5 and 6 of Appendix 4, while relevant codes are included with raw-data tabulations in Appendix 4.

Table 1. Plant tests and the arithmetic average numbers of results per round submitted by participating laboratories in the ASPAC 2022 Plant ILPP.

Plant Tests	Symbol	Units	Number of results submitted by participating laboratories		
			Feb 22	May 22	Aug 22
Aluminium	Al	mg/kg	30	25	23
Boron	B	mg/kg	33	29	26
Cadmium	Cd	µg/kg	21	18	18
Calcium	Ca	%	36	32	30
Carbon	C	%	24	23	24
Chloride	Cl	mg/kg	19	18	17
Cobalt	Co	µg/kg	23	20	20
Copper	Cu	mg/kg	35	30	29
Iron	Fe	mg/kg	35	31	29
Lead	Pb	µg/kg	21	17	16
Magnesium	Mg	%	36	32	29
Manganese	Mn	mg/kg	35	31	29
Molybdenum	Mo	µg/kg	23	22	20
Nitrogen	N	%	30	29	29
Nitrate Nitrogen	NO3-N	mg/kg	17	16	14
Phosphorus	P	%	36	32	30
Potassium	K	%	36	32	30
Selenium	Se	µg/kg	20	18	18
Silicon (NOT CERTIFIED)	Si	%	12	10	11
Sodium	Na	%	35	30	27
Sulphur	S	%	34	28	26
Zinc	Zn	mg/kg	34	31	29

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)[3]. 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[4].

Ultimately, the samples used in the three rounds of the 2022 program were distributed and coded as follows: February 2022: ASP 2202-1 to 2202-4; May 2022: ASP 2205-1 to 2205-4 and August 2022: ASP 2208-1 to 2208-4. 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. There were 8 plant tissue samples sourced from Australia, 4 plant tissue samples from New Zealand, with 9 samples previously presented in earlier ILPP years.

Table 2. Sample identification and the origin of the samples included in the 2022 ASPAC plant ILPP.

Sample ID	*Round ID*	*Sample Type*	*Origin*	*Previous Rounds*
ASP 2202-1	**Round 2 20220208**	Camelia Leaves	New Zealand	ASP2008-1, ASP1805-3
ASP 2202-2		Wholegrain Oats	Australia	ASP2005-1
ASP 2202-3		Spinach Leaves	Australia	ASP2005-4
ASP 2202-4		Mixed Pasture	New Zealand	New
ASP 2205-1	**Round 5 20220502**	Avocado Leaves	New Zealand	New
ASP 2205-2		Barley	Australia	ASP2008-4
ASP 2205-3		Split Peas	Australia	ASP2105-4
ASP 2205-4		Mixed Pasture Haylage/Baleage	New Zealand	New
ASP 2208-1	**Round 8 20220801**	Brown Rice	Australia	ASP2108-4
ASP 2208-2		Eggplant Leaves	Australia	ASP2108-1
ASP 2208-3		Citrus Leaves (Orange)	Australia	ASP1902-1
ASP 2208-4		Lucerne Chaff	Australia	ASP2102-3, ASP1905-4

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

4 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.

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[5,6] 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.

Interim reports for each "round" summarizing the 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 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 annual 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 the test/s received ASPAC Certification (if applicable), were provided. The confidential laboratory code number was included.

5 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.

6 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.)

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 when 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[7]. 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[8]	The robust coefficient of variation (Robust % CV) = (100 x normalised IQR / median). For simplicity, the Robust %CV shown is for the initial results, and 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.

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7 SAS Procedure Guide.

8 "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) are 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 are allocated to each statistical "outlier", while a statistical "straggler" is allocated one demerit point. As no sample result can be both an "outlier" and a "straggler" a maximum of two demerit points is all that can accrue per sample for a specific test.

For any single "round" of four samples, three (3) is set as the maximum number of demerit points for a specific test. This is done so that unsatisfactory measurement of a test in one "round" does 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" is missed, the maximum number of three demerit points for every test in that "round" is allocated, unless very special circumstances are applied and are known or advised expeditiously to the ASPAC-LPC through its Convenor. When the explanation is accepted, performance from the three most recently completed rounds are used to assess eligibility for certification.

If less than seven laboratories submit results for a particular test or sample, proficiency assessments cannot be made statistically with an acceptable level of confidence and certification for the specific test may not be granted.

Certification is not provided for the (total) plant Si test as the LPC has determined that laboratories using digestion procedures are not likely getting all plant Si into solution because Si is mostly insoluble in digestion acids except hydrofluoric acid. Few participating laboratories currently submit results using methods that have been demonstrated to determine true total Si, for example 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. ASPAC currently provides details of certified laboratories by test on its public website. Certifications obtained in the 2022 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.

2022: Total Aluminum (mg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	30	30	30	30	25	25	25	25	22	23	23	23
Minimum	5860	1.45	140	160	29.5	0.917	0.806	237	0.0001	25.3	174	313
Maximum	9300	56	507	319	63.2	8.75	4.76	485	5.02	70	390	483
Median i	7670	4.92	310	242	35.3	2.61	2.19	391	2	40.6	333	409
Mean i	7660	7.71	303	241	37.9	3.06	2.48	392	2.09	41.9	321	406
MAD i	315	2.21	22.5	18	4.2	0.84	0.69	33	0.545	3.6	22	25
IQR i	603	4.77	42.5	35	7.7	1.5	1.08	59	1.06	6.55	33.5	49.5
Robust CV % i	6	72	10	11	16	43	37	11	39	12	7	9
Median f	7710	4.15	311	242	34.8	2.47	2.03	396	1.85	40.2	334	415
Mean f	7710	4.74	312	243	34.6	2.41	2.14	399	1.81	39.9	335	411
MAD f	250	1.81	11	16	3.6	0.53	0.26	29.5	0.415	2.5	16	25.5
IQR f	510	3.39	19.8	31.5	5.7	1.06	0.39	61	0.878	5.25	35	47.5
Robust CV % f	5	61	5	10	12	32	14	11	35	10	8	8
Outliers	5	4	8	3	4	2	1	1	4	3	2	1
Stragglers	0	0	4	0	0	2	3	0	0	1	0	0

2022: Total Boron (mg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	33	33	33	33	29	29	29	29	24	26	26	26
Minimum	34.6	0.212	10.4	0.295	16.8	0.256	4.7	7.25	0.447	32.9	55.9	9.64
Maximum	91.3	11.4	24.9	19.1	33.7	9.71	15.5	21.7	10	52.2	92.9	19.2
Median i	49.2	1.31	14.9	4.83	22.8	0.971	6.64	10	0.754	42.6	79.9	13
Mean i	50.1	2.18	15.6	5.31	23.6	1.21	6.96	10.5	1.49	42.3	79.4	12.9
MAD i	3.2	0.25	1	0.71	1.6	0.139	0.46	0.67	0.186	1.35	4	0.4
IQR i	6.1	0.48	1.9	1.29	3	0.252	0.91	1.68	0.459	3.5	7.75	0.775
Robust CV % i	9	27	9	20	10	19	10	12	45	6	7	4
Median f	49.2	1.26	14.9	4.83	22.5	0.976	6.64	10	0.688	42.6	80.6	13
Mean f	49.3	1.28	14.8	4.96	22.5	0.98	6.57	10.1	0.72	42.3	81	13
MAD f	2.9	0.16	0.9	0.49	1.45	0.118	0.32	0.6	0.113	1.2	3.55	0.2
IQR f	5.8	0.33	1.7	1.08	2.53	0.24	0.765	1	0.232	2.95	6.85	0.3
Robust CV % f	9	19	8	17	8	18	9	7	25	5	6	2
Outliers	4	8	5	5	5	6	6	5	4	4	2	8
Stragglers	0	2	0	3	0	0	0	1	1	0	0	3

2022: Total Cadmium (µg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	20	21	22	22	19	17	18	19	18	18	16	18
Minimum	11.3	1.23	287	10.3	247	0.318	10	51.2	11.1	0.86	0.01	108
Maximum	299	105	1340	922	513	45.7	32	91	27	44.1	16.5	281
Median i	15.8	3.86	1080	43.7	313	2.72	19.6	66.3	18.3	13.6	1.99	146
Mean i	35.5	14.9	1010	82.9	313	5.96	20	66	18.1	18.5	3.43	151
MAD i	3.55	1.87	60	2.75	24	1.81	1.8	6.2	1.2	6.75	0.625	5.5
IQR i	5.85	4.76	197	6.48	54	4.23	3.18	12.8	2.7	11.6	1.72	9.75
Robust CV % i	28	92	14	11	13	115	12	14	11	63	64	5
Median f	15.8	3.86	1080	43.7	313	2.72	19.6	66.3	18.3	13.6	1.99	146
Mean f	15.9	4.29	1050	44.4	302	3.04	19.3	64.6	18.3	15.5	1.82	146
MAD f	3.55	1.87	60	2.75	24	1.81	1.8	6.2	1.2	6.75	0.625	5.5
IQR f	4.9	1.2	100	3.7	50.3	3.75	2.55	10.9	2.1	8.53	1.19	7.25
Robust CV % f	23	23	7	6	12	102	10	12	9	46	44	4
Outliers	3	3	3	8	1	2	3	1	3	2	3	2
Stragglers	0	0	0	0	0	0	0	0	0	0	0	0

2022: Total Calcium (%w/w)

Statistical parameters	February 2022 (Round 2)				May 2022 (Round 5)				August 2022 (Round 8)			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	36	36	36	36	32	32	32	32	30	30	30	30
Minimum	0.881	0.0219	1.1	0.381	0.855	0.001	0.000498	0.513	0.00306	3.19	2.11	0.439
Maximum	1.74	0.0814	1.74	0.65	1.66	0.21	0.0451	0.857	0.098	4.89	3.25	0.688
Median i	1.46	0.0521	1.4	0.502	1.52	0.023	0.039	0.743	0.00877	4.58	3.02	0.632
Mean i	1.43	0.0518	1.4	0.502	1.48	0.0281	0.0365	0.739	0.0119	4.44	2.91	0.613
MAD i	0.05	0.0021	0.055	0.022	0.065	0.001	0.002	0.0235	0.000815	0.17	0.12	0.018
IQR i	0.103	0.00385	0.103	0.049	0.145	0.00205	0.0034	0.0488	0.0019	0.495	0.275	0.037
Robust CV % i	5	5	5	7	7	7	6	5	16	8	7	4
Median f	1.46	0.0522	1.4	0.502	1.52	0.023	0.039	0.745	0.0084	4.65	3.04	0.636
Mean f	1.45	0.0523	1.4	0.498	1.5	0.0229	0.0392	0.751	0.00847	4.64	3.04	0.635
MAD f	0.05	0.0018	0.045	0.016	0.06	0.001	0.0019	0.017	0.0006	0.08	0.06	0.012
IQR f	0.09	0.0038	0.085	0.031	0.13	0.00175	0.00375	0.037	0.00115	0.13	0.105	0.0235
Robust CV % f	5	5	5	5	6	6	7	4	10	2	3	3
Outliers	3	5	4	4	1	6	4	6	5	3	5	5
Stragglers	0	0	0	3	0	0	0	2	2	6	2	2

2022: Total Carbon (%w/w)

Statistical parameters	February 2022 (Round 2)				May 2022 (Round 5)				August 2022 (Round 8)			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	24	24	24	24	23	23	23	23	24	24	24	24
Minimum	41.7	42.1	37.1	39	45.8	40	39.5	39.9	39.3	33.8	41.2	40.5
Maximum	46.2	47.1	41.1	44.7	53.8	45.4	46.5	45.7	46.4	38.6	47.1	46.1
Median i	45.6	46.2	40.3	43.9	49	43.5	43.6	44.1	43.1	36.6	44.3	43.5
Mean i	45	45.6	40	43.4	49	43.2	43.4	43.7	43	36.4	44.2	43.4
MAD i	0.4	0.7	0.45	0.5	0.5	0.9	1	0.5	1.05	0.35	0.45	0.4
IQR i	1.13	1.53	0.925	1.05	1.1	1.7	1.85	1.15	2.1	0.925	0.825	1
Robust CV % i	2	2	2	2	2	3	3	2	4	2	1	2
Median f	45.6	46.2	40.5	44.1	49	43.6	43.6	44.2	43.2	36.7	44.3	43.5
Mean f	45.4	46	40.4	43.9	48.9	43.3	43.5	44.2	43.2	36.6	44.2	43.5
MAD f	0.4	0.6	0.25	0.35	0.5	0.85	0.95	0.45	1.1	0.1	0.3	0.4
IQR f	0.4	1	0.525	0.675	1.1	1.65	1.78	0.7	2.05	0.425	0.575	0.7
Robust CV % f	1	2	1	1	2	3	3	1	4	1	1	1
Outliers	3	3	3	3	2	1	1	3	1	5	4	3
Stragglers	0	0	1	1	0	0	0	0	0	3	0	0

2022: Total Chloride (mg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	19	19	19	19	18	18	18	18	17	17	17	17
Minimum	62.8	286	1920	10200	542	957	156	7140	0.05	0.15	0.1	0.725
Maximum	2670	1120	3920	14400	2630	1550	1560	15600	3400	2690	2810	9300
Median i	250	465	2710	13200	887	1190	297	10800	309	2000	1100	8210
Mean i	492	501	2740	12900	1080	1200	423	10500	463	1910	1400	7690
MAD i	130	77	270	600	113	75	69	600	72	60	200	300
IQR i	284	125	455	1500	215	160	212	1600	108	110	430	500
Robust CV % i	84	20	12	8	18	10	53	11	26	4	29	5
Median f	140	440	2710	13300	859	1170	282	10900	309	2000	1090	8230
Mean f	178	442	2680	13100	812	1180	306	10600	287	1990	1080	8290
MAD f	70.6	60	100	500	77.5	60	62	450	39	40	55	220
IQR f	178	116	250	1000	181	140	112	800	80	60	95	330
Robust CV % f	95	20	7	6	16	9	29	5	19	2	6	3
Outliers	4	2	2	1	3	1	3	3	3	6	5	2
Stragglers	1	0	4	1	1	0	0	1	1	2	2	2

2022: Total Cobalt (µg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	23	22	23	23	20	19	20	21	19	20	20	20
Minimum	10.7	4.02	156	69.2	14.7	0.1	32.4	203	0.8	2	46.9	341
Maximum	1000	1000	1000	1000	120	61	82.8	332	80	130	326	653
Median i	20.2	15.8	191	96.5	33.1	6.47	47.8	236	9.18	32.3	79.3	399
Mean i	76.8	69.2	238	146	40.9	12.6	51.9	241	13.6	37.2	102	420
MAD i	2	3.3	13.5	10	5.85	2.92	1.95	10	1.58	5.5	8.3	20
IQR i	10.1	7.35	30	27.6	13.3	6.22	5.18	20	3.38	9.9	24.1	37.3
Robust CV % i	37	34	12	21	30	71	8	6	27	23	23	7
Median f	20.2	15.8	191	96.5	33.1	6.47	47.8	236	9.18	32.3	79.3	399
Mean f	20.3	16.2	189	97.6	31.6	5.7	47.5	234	9.89	32.7	83.2	392
MAD f	2	3.3	13.5	10	5.85	2.92	1.95	10	1.58	5.5	8.3	20
IQR f	3.25	3.5	20.5	18.8	7.4	3.67	2.83	18.5	1.9	7.6	22.9	27
Robust CV % f	12	16	8	14	17	42	4	6	15	17	21	5
Outliers	7	4	4	3	4	4	6	2	5	3	4	3
Stragglers	0	0	0	0	0	0	0	0	0	0	0	0

2022: Total Copper (mg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	**ASP 2202-2**	**ASP 2202-3**	**ASP 2202-4**	**ASP 2205-1**	**ASP 2205-2**	**ASP 2205-3**	**ASP 2205-4**	**ASP 2208-1**	**ASP 2208-2**	**ASP 2208-3**	**ASP 2208-4**
No of results	35	35	35	35	30	30	30	30	29	29	29	29
Minimum	3.63	3.13	7.57	6.5	34.5	4.68	4.7	0.17	1.72	13.9	110	10.4
Maximum	11.3	6.18	13.3	11.3	84.4	8.61	10.8	10.2	6.83	19.2	147	13.5
Median i	4.46	3.94	9.08	7.97	58.6	5.79	5.73	6.08	4.32	15.7	127	11.6
Mean i	4.71	4.09	9.16	8.11	57.5	5.9	5.88	6.09	4.4	15.9	127	11.7
MAD i	0.2	0.11	0.32	0.27	3.85	0.27	0.33	0.36	0.18	0.5	5	0.6
IQR i	0.38	0.19	0.59	0.56	6.93	0.408	0.633	0.69	0.35	1	9	1.2
Robust CV % i	6	4	5	5	9	5	8	8	6	5	5	8
Median f	4.44	3.93	9.07	7.96	58.8	5.8	5.67	6.1	4.31	15.7	127	11.6
Mean f	4.44	3.93	9.02	7.97	59.4	5.85	5.63	6.13	4.27	15.6	127	11.7
MAD f	0.105	0.04	0.23	0.13	2.5	0.12	0.35	0.28	0.11	0.45	5	0.6
IQR f	0.208	0.0825	0.383	0.255	5.43	0.25	0.643	0.6	0.21	0.825	7.75	1.2
Robust CV % f	3	2	3	2	7	3	8	7	4	4	5	8
Outliers	5	8	5	8	5	6	2	6	6	5	3	0
Stragglers	4	5	2	3	1	5	0	1	2	0	0	0

2022: Total Iron (mg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	**ASP 2202-2**	**ASP 2202-3**	**ASP 2202-4**	**ASP 2205-1**	**ASP 2205-2**	**ASP 2205-3**	**ASP 2205-4**	**ASP 2208-1**	**ASP 2208-2**	**ASP 2208-3**	**ASP 2208-4**
No of results	35	35	35	35	31	31	31	31	29	29	29	29
Minimum	17.2	5.64	278	176	34.8	23.4	24.9	281	6.19	98.7	159	230
Maximum	73.3	187	399	354	75.9	67.2	64.7	396	38.4	134	224	386
Median i	56.2	29.7	341	211	54.4	38.9	40.1	325	11.6	104	204	341
Mean i	56.1	33.3	339	213	54.1	39.7	40.1	328	12.6	107	199	334
MAD i	2.8	2.1	10	13	2.5	2.5	1.9	16	1	4	7	19
IQR i	4.85	3.85	19.5	25	5	5.55	2.85	32	1.8	8	14	38
Robust CV % i	6	10	4	9	7	11	5	7	12	6	5	8
Median f	56.1	29.9	345	211	54.4	38.9	40.7	324	11.6	103	206	341
Mean f	56.1	29.8	345	209	54.1	39.5	40.7	324	11.6	104	205	341
MAD f	1.75	1.6	10	12.5	1.4	2.2	1.2	15	0.9	2	4	17
IQR f	3.68	3	15	22.8	2.8	4.25	2.35	29	1.7	4	7	26.5
Robust CV % f	5	7	3	8	4	8	4	7	11	3	3	6
Outliers	6	4	7	1	3	4	4	2	4	3	5	2
Stragglers	1	3	1	0	3	0	3	0	0	2	4	0

2022: Total Lead (µg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	20	18	21	21	17	17	16	18	16	16	17	16
Minimum	0.544	0.5	4.89	67.2	4.6	0.1	0.1	0.141	0.563	212	93	130
Maximum	1010	1000	2350	1000	500	200	200	400	80	500	400	400
Median i	79	5.6	226	174	79.3	19.5	4.04	168	3.4	246	110	154
Mean i	173	93.7	355	251	106	34.6	20.3	179	13.9	269	136	173
MAD i	8	2.2	25.5	16.5	4.65	6.1	2.41	15	2.4	9	8	5
IQR i	13.4	6.74	54	51	13.4	13.8	8.06	66	4.62	25.5	27	10.5
Robust CV % i	13	89	18	22	13	52	148	29	101	8	18	5
Median f	79	5.6	226	174	79.3	19.5	4.04	168	3.4	246	110	154
Mean f	78.2	5.54	234	177	78.6	17.4	3.91	169	3.94	249	113	152
MAD f	8	2.2	25.5	16.5	4.65	6.1	2.41	15	2.4	9	8	5
IQR f	9.33	4.67	35	27.5	4	10.2	2.49	19.5	3.8	14	15.3	6
Robust CV % f	9	62	11	12	4	39	46	9	83	4	10	3
Outliers	4	4	4	7	7	3	4	6	3	4	3	3
Stragglers	0	0	0	0	0	0	0	0	0	0	0	0

2022: Total Magnesium (%w/w)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	36	36	36	36	32	32	32	32	29	29	29	29
Minimum	0.066	0.0803	0.66	0.176	0.299	0.0607	0.0806	0.177	0.0527	0.895	0.214	0.167
Maximum	0.1	0.151	134	0.285	0.508	0.135	0.148	0.267	0.141	2.11	0.31	0.259
Median i	0.0803	0.126	0.82	0.208	0.38	0.097	0.109	0.194	0.122	1.04	0.28	0.234
Mean i	0.0804	0.125	4.51	0.211	0.378	0.0971	0.11	0.197	0.121	1.08	0.277	0.233
MAD i	0.0035	0.006	0.03	0.011	0.011	0.003	0.0045	0.009	0.004	0.04	0.008	0.007
IQR i	0.00678	0.012	0.063	0.0178	0.0263	0.00633	0.00775	0.0165	0.009	0.08	0.023	0.013
Robust CV % i	6	7	6	6	5	5	5	6	5	6	6	4
Median f	0.0808	0.126	0.825	0.207	0.381	0.097	0.109	0.192	0.122	1.04	0.28	0.236
Mean f	0.081	0.126	0.817	0.207	0.379	0.0963	0.108	0.191	0.123	1.04	0.278	0.236
MAD f	0.003	0.006	0.026	0.0105	0.01	0.003	0.003	0.0075	0.003	0.035	0.008	0.005
IQR f	0.00618	0.012	0.054	0.0183	0.0193	0.006	0.0055	0.0125	0.00525	0.065	0.0185	0.01
Robust CV % f	6	7	5	7	4	5	4	5	3	5	5	3
Outliers	3	3	5	2	4	3	3	2	3	3	2	3
Stragglers	1	0	0	0	0	0	2	2	2	0	0	3

2022: Total Manganese (mg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	35	35	35	35	31	31	31	31	29	29	29	29
Minimum	1440	20.5	120	58.2	147	10.1	10.8	39.5	15.6	150	18.8	25.6
Maximum	2360	65.8	176	86.1	227	15.8	13.8	163	32.1	257	35.1	48.3
Median i	1830	49.6	141	65.4	197	14.1	12.1	146	25	211	28.6	39
Mean i	1860	49.5	142	66.3	193	13.7	12.1	143	25	210	28.3	38.4
MAD i	90	2.3	5	3.2	8	0.7	0.6	4	0.7	7	0.7	1
IQR i	175	4.5	8.5	5.85	16.5	1.55	1.25	8.5	1.5	15	1.3	2.2
Robust CV % i	7	7	4	7	6	8	8	4	4	5	3	4
Median f	1820	49.7	141	65.4	201	14.2	12.1	146	25	211	28.6	39.2
Mean f	1840	50.1	142	65.7	199	13.8	12.1	146	24.9	210	28.5	39.2
MAD f	70	2.1	2.5	3.15	4.5	0.7	0.6	4	0.7	6	0.55	0.7
IQR f	145	3.75	6	5.75	9.5	1.38	1.25	7.25	1.28	12	1	1.28
Robust CV % f	6	6	3	7	4	7	8	4	4	4	3	2
Outliers	3	2	4	1	5	1	0	3	5	4	4	5
Stragglers	1	1	3	0	2	0	0	0	0	0	1	2

2022: Total Molybdenum (µg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	24	23	23	23	22	22	22	22	20	20	20	20
Minimum	46	840	58	260	125	704	2000	461	135	7350	171	1100
Maximum	1000	1250	407	1170	300	1320	3390	815	230	11000	260	2170
Median i	250	1090	277	911	173	861	2380	580	167	9070	190	1340
Mean i	271	1080	270	880	181	861	2360	591	168	9090	198	1360
MAD i	16.5	55	12	28	15.5	44.5	105	42	10	340	16	40
IQR i	32.8	115	27.5	80	36.3	89	223	85.5	21.5	680	32.3	118
Robust CV % i	10	8	7	7	16	8	7	11	10	6	13	7
Median f	250	1090	277	911	173	861	2380	580	167	9070	190	1340
Mean f	249	1100	273	910	170	853	2340	581	164	9000	191	1340
MAD f	16.5	55	12	28	15.5	44.5	105	42	10	340	16	40
IQR f	26	110	21.5	54	34	71.5	200	87	21	420	25.5	60
Robust CV % f	8	8	6	4	15	6	6	11	9	3	10	3
Outliers	5	2	4	6	2	3	3	1	1	3	2	5
Stragglers	0	0	0	0	0	0	0	0	0	0	0	0

2022: Total Nitrogen (%w/w)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	**ASP 2202-2**	**ASP 2202-3**	**ASP 2202-4**	**ASP 2205-1**	**ASP 2205-2**	**ASP 2205-3**	**ASP 2205-4**	**ASP 2208-1**	**ASP 2208-2**	**ASP 2208-3**	**ASP 2208-4**
No of results	30	30	30	30	29	29	29	28	29	29	29	29
Minimum	0.88	1.41	3.69	2.64	2.1	0.54	3.4	1.35	1.2	4.7	2.04	1.5
Maximum	1.11	2.11	4.36	4.2	2.58	1.67	4.04	2.07	1.48	5.84	2.7	1.81
Median i	1.02	1.71	4.21	4.01	2.33	1.55	3.77	1.98	1.34	5.44	2.33	1.63
Mean i	1.02	1.72	4.18	3.95	2.32	1.52	3.73	1.93	1.34	5.4	2.33	1.64
MAD i	0.02	0.045	0.08	0.105	0.05	0.05	0.1	0.05	0.04	0.11	0.04	0.03
IQR i	0.04	0.0775	0.148	0.188	0.11	0.1	0.22	0.153	0.09	0.19	0.08	0.07
Robust CV % i	3	3	3	3	3	5	4	6	5	3	3	3
Median f	1.02	1.71	4.23	4.01	2.33	1.56	3.8	1.99	1.34	5.45	2.33	1.63
Mean f	1.03	1.72	4.22	3.99	2.32	1.55	3.78	1.98	1.34	5.43	2.33	1.63
MAD f	0.02	0.045	0.07	0.1	0.03	0.05	0.09	0.04	0.04	0.09	0.04	0.03
IQR f	0.03	0.0725	0.135	0.18	0.07	0.095	0.17	0.075	0.08	0.17	0.08	0.0575
Robust CV % f	2	3	2	3	2	5	3	3	4	2	3	3
Outliers	5	2	3	1	2	1	2	3	2	3	4	3
Stragglers	0	0	0	0	4	0	2	2	0	0	0	0

2022: Nitrate Nitrogen (mg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	**ASP 2202-2**	**ASP 2202-3**	**ASP 2202-4**	**ASP 2205-1**	**ASP 2205-2**	**ASP 2205-3**	**ASP 2205-4**	**ASP 2208-1**	**ASP 2208-2**	**ASP 2208-3**	**ASP 2208-4**
No of results	17	17	17	17	16	16	16	16	14	14	14	14
Minimum	0.001	0.001	50	50	2	0.552	1.24	20	0.0001	25.3	1	1
Maximum	73.8	57.5	1110	1240	41.9	26.4	45	44.9	33	10000	185	313
Median i	5.48	4.13	980	1060	8.71	5.35	3.81	27.9	1.59	8920	9.47	53.2
Mean i	12.2	9.98	887	1010	13.3	7.94	11.3	30.6	4.54	8060	23.8	68.9
MAD i	2.4	1.88	33	50	3.3	2.99	2.18	3.25	0.43	385	4.87	3.85
IQR i	4.6	3.75	54	90	8.98	6.14	8.86	9.9	0.8	655	12.4	6.18
Robust CV % i	62	67	4	6	76	85	172	26	37	5	97	9
Median f	4.43	2.96	987	1060	8.28	3.01	3.25	25.9	1.32	8940	8.28	53.2
Mean f	4.63	3.32	986	1060	7.81	3.79	3.59	26.5	1.35	9000	7.85	52.6
MAD f	2.29	1.85	14	40	1.16	1.65	1.35	1.4	0.425	160	1.66	1.8
IQR f	4.12	3.16	24	70	1.71	3.61	2.3	2.85	0.77	445	3.05	4
Robust CV % f	69	79	2	5	15	89	52	8	43	4	27	6
Outliers	3	3	3	1	3	3	4	2	3	2	1	3
Stragglers	0	0	3	1	3	1	0	3	0	1	3	1

2022: Total Phosphorus (%w/w)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	36	36	36	36	32	32	32	32	30	30	30	30
Minimum	0.0646	0.0362	0.271	0.296	0.0896	0.236	0.286	0.218	0.257	0.384	0.0746	0.25
Maximum	0.13	0.522	0.501	0.579	0.176	0.375	0.427	0.361	0.43	0.897	0.201	0.482
Median i	0.0855	0.385	0.383	0.419	0.137	0.317	0.382	0.312	0.341	0.787	0.16	0.385
Mean i	0.0871	0.375	0.382	0.418	0.137	0.315	0.376	0.313	0.339	0.762	0.159	0.381
MAD i	0.0025	0.015	0.0105	0.0125	0.0055	0.013	0.012	0.0155	0.016	0.032	0.007	0.0155
IQR i	0.00493	0.0303	0.0198	0.0248	0.0113	0.025	0.024	0.0323	0.0328	0.0713	0.0145	0.0313
Robust CV % i	4	6	4	4	6	6	5	8	7	7	7	6
Median f	0.0854	0.387	0.383	0.42	0.138	0.318	0.383	0.312	0.342	0.791	0.16	0.386
Mean f	0.0859	0.387	0.385	0.418	0.138	0.318	0.384	0.317	0.341	0.79	0.161	0.386
MAD f	0.0024	0.014	0.008	0.01	0.005	0.009	0.009	0.012	0.013	0.024	0.007	0.015
IQR f	0.0038	0.0275	0.015	0.019	0.0095	0.017	0.0168	0.032	0.0235	0.045	0.0128	0.029
Robust CV % f	3	5	3	3	5	4	3	8	5	4	6	6
Outliers	5	4	7	6	3	3	4	2	3	4	4	3
Stragglers	0	1	0	1	2	2	2	1	0	1	0	0

2022: Total Potassium (%w/w)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	36	36	36	36	32	32	32	32	30	30	30	30
Minimum	0.68	0.164	3.85	2.75	0.67	0.197	0.666	1.61	0.131	3.5	0.173	1.5
Maximum	1.05	0.442	7.45	4.21	1.01	0.493	1.28	2.46	0.349	5.78	1.89	2.15
Median i	0.909	0.37	5.84	3.39	0.914	0.411	1.02	2.1	0.289	5.23	1.74	1.86
Mean i	0.906	0.365	5.8	3.41	0.895	0.4	1.01	2.04	0.284	5.05	1.65	1.83
MAD i	0.0345	0.015	0.27	0.195	0.035	0.019	0.055	0.11	0.0095	0.315	0.05	0.085
IQR i	0.0663	0.0318	0.528	0.373	0.094	0.0388	0.127	0.225	0.0193	0.515	0.123	0.165
Robust CV % i	5	6	7	8	8	7	9	8	5	7	5	7
Median f	0.919	0.371	5.9	3.39	0.925	0.417	1.04	2.11	0.289	5.24	1.76	1.87
Mean f	0.919	0.374	5.94	3.36	0.922	0.414	1.03	2.11	0.288	5.2	1.75	1.86
MAD f	0.029	0.0115	0.18	0.15	0.023	0.013	0.03	0.06	0.0065	0.25	0.03	0.05
IQR f	0.0625	0.0245	0.34	0.285	0.041	0.0258	0.0575	0.105	0.0118	0.47	0.07	0.1
Robust CV % f	5	5	4	6	3	5	4	4	3	7	3	4
Outliers	3	4	8	3	3	5	4	4	7	2	6	4
Stragglers	1	2	1	1	4	3	2	5	1	1	3	1

2022: Total Selenium (µg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	21	20	20	20	17	18	18	17	18	17	18	18
Minimum	0.01	21.3	0.01	18.1	35.2	26.3	808	14.7	5	0.01	39.7	32.7
Maximum	3030	1900	1200	1700	1170	1360	1380	1000	530	1000	560	1500
Median i	38.2	150	28.1	88.7	107	967	933	48	16.8	19	83.4	80.3
Mean i	246	239	115	176	168	977	1000	163	56.7	85.9	117	166
MAD i	12	26.5	9.35	23.7	23	63	67	13	3.2	11.7	13.4	8.7
IQR i	30.8	53	48.2	39.5	42	161	142	25.1	8.18	30	32.5	16.6
Robust CV % i	60	26	127	33	29	12	11	39	36	117	29	15
Median f	38.2	150	28.1	88.7	107	967	933	48	16.8	19	83.4	80.3
Mean f	36.3	144	25.5	76.8	106	973	958	42.8	16.5	22.2	77.1	80.7
MAD f	12	26.5	9.35	23.7	23	63	67	13	3.2	11.7	13.4	8.7
IQR f	15.3	43.5	9.28	30	42.8	104	91.8	19	4.05	17.8	21.3	9.7
Robust CV % f	30	22	25	25	30	8	7	29	18	70	19	9
Outliers	5	4	6	3	1	4	2	4	4	3	3	4
Stragglers	0	0	0	0	0	0	0	0	0	0	0	0

2022: Total Silicon (%w/w) – Not Certified

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	12	12	12	12	10	10	10	10	11	11	11	11
Minimum	0.003	0.003	0.007	0.006	0.0313	0.0049	0.0008	0.011	0.002	0.0023	0.0028	0.008
Maximum	0.994	0.0729	0.301	0.742	0.264	0.0988	0.0722	0.899	0.084	0.0955	0.163	1.45
Median i	0.0808	0.0171	0.0425	0.0656	0.0592	0.00875	0.0011	0.089	0.00997	0.029	0.061	0.07
Mean i	0.174	0.0242	0.0849	0.211	0.0904	0.0237	0.0135	0.182	0.0225	0.0376	0.0626	0.211
MAD i	0.0368	0.00545	0.0101	0.0366	0.0232	0.0025	0.00009	0.057	0.00203	0.006	0.0124	0.0462
IQR i	0.137	0.0103	0.0353	0.194	0.0338	0.00895	0.00112	0.0939	0.0055	0.0255	0.0222	0.0846
Robust CV % i	125	45	62	219	42	76	76	78	41	65	27	90
Median f	0.08	0.016	0.0397	0.039	0.0465	0.0083	0.0011	0.0728	0.009	0.0245	0.061	0.061
Mean f	0.099	0.0165	0.0385	0.0461	0.049	0.00829	0.00108	0.0673	0.00911	0.0265	0.0581	0.0533
MAD f	0.032	0.0036	0.006	0.021	0.0151	0.0007	0.00002 5	0.031	0.002	0.0045	0.012	0.04
IQR f	0.0905	0.00603	0.012	0.0512	0.0285	0.0011	0.00006	0.0612	0.003	0.006	0.014	0.059
Robust CV % f	84	28	22	97	45	10	4	62	25	18	17	72
Outliers	1	2	3	3	2	2	3	2	2	4	2	2
Stragglers	0	0	1	0	0	1	1	0	0	0	0	0

2022: Total Sodium (mg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	35	35	35	35	30	30	30	30	27	27	27	27
Minimum	0.02	0.009	0.013	0.318	31.1	159	11.9	2000	0.001	0.024	0.009	0.188
Maximum	408	85	230	4210	108	349	94	3090	92	479	176	2820
Median i	183	25.7	91.3	3290	43.6	284	18	2680	15.4	242	91.6	2120
Mean i	188	27.3	92	3210	50	279	24.5	2620	18.2	244	96.4	2000
MAD i	9	3.3	9.7	110	3.25	16	2.1	160	4.6	12	7.8	80
IQR i	18.5	7.35	18.6	210	16	31.5	9.5	305	8.3	22	14.4	230
Robust CV % i	7	21	15	5	27	8	39	8	40	7	12	8
Median f	184	26.1	91.7	3270	41.9	287	17.2	2690	14.9	240	91	2120
Mean f	185	26	92.5	3280	42	286	17.2	2660	14.5	236	90.6	2120
MAD f	7.5	2.05	8.3	80	1.65	17.5	1.1	150	3.8	9	4.4	70
IQR f	12	3.53	16	160	2.98	31.3	2	283	7.35	17	7.4	100
Robust CV % f	5	10	13	4	5	8	9	8	37	5	6	3
Outliers	8	7	6	8	12	4	9	2	2	4	4	6
Stragglers	1	4	1	2	0	0	2	0	1	2	2	0

2022: Total Sulphur (%w/w)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
	ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
No of results	33	33	34	34	28	28	28	28	26	26	26	26
Minimum	0.15	0.11	0.344	0.27	0.173	0.0787	0.1	0.172	0.0758	0.372	0.14	0.121
Maximum	0.23	0.182	0.632	0.486	0.266	0.138	0.164	0.272	0.127	0.705	0.235	0.19
Median i	0.193	0.139	0.437	0.351	0.231	0.104	0.13	0.224	0.0918	0.658	0.213	0.168
Mean i	0.192	0.138	0.433	0.356	0.228	0.104	0.129	0.224	0.0934	0.639	0.209	0.167
MAD i	0.009	0.011	0.023	0.025	0.01	0.0055	0.0055	0.0165	0.0039	0.0215	0.0075	0.004
IQR i	0.017	0.021	0.041	0.0468	0.0193	0.00993	0.0103	0.0303	0.00685	0.0478	0.0153	0.00925
Robust CV % i	7	11	7	10	6	7	6	10	6	5	5	4
Median f	0.194	0.137	0.438	0.349	0.231	0.104	0.13	0.224	0.0911	0.66	0.213	0.168
Mean f	0.196	0.136	0.435	0.348	0.23	0.104	0.13	0.224	0.091	0.661	0.214	0.169
MAD f	0.005	0.01	0.011	0.018	0.007	0.004	0.004	0.0165	0.0029	0.01	0.0065	0.003
IQR f	0.011	0.019	0.0225	0.0313	0.013	0.00675	0.0075	0.0303	0.0051	0.0193	0.0128	0.0055
Robust CV % f	4	10	4	7	4	5	4	10	4	2	4	2
Outliers	6	1	3	3	2	3	2	0	3	2	2	4
Stragglers	2	1	4	3	1	3	2	0	1	2	0	3

2022: Total Zinc (mg/kg)

Statistical parameters	Plant sample identification and values											
	February 2022 (Round 2)				***May 2022 (Round 5)***				***August 2022 (Round 8)***			
	ASP 2202-1	**ASP 2202-2**	**ASP 2202-3**	**ASP 2202-4**	**ASP 2205-1**	**ASP 2205-2**	**ASP 2205-3**	**ASP 2205-4**	**ASP 2208-1**	**ASP 2208-2**	**ASP 2208-3**	**ASP 2208-4**
No of results	34	34	35	34	31	31	31	31	29	29	29	29
Minimum	11.3	14.4	74	25	22	9.96	16.4	15.6	17.6	24.1	17.4	18.7
Maximum	23.3	20.7	114	40.7	33.5	17.9	24	26	28	68.3	24.3	26.9
Median i	13.9	17.9	95.3	32.8	27.8	13.5	20.8	20.9	21.2	28.9	22.3	23.4
Mean i	14.2	17.8	94.4	32.5	27.5	13.5	20.7	20.9	21.2	30.2	22	23.3
MAD i	0.8	1.05	4.4	1.7	1.3	0.8	0.9	1.3	1.2	1.2	1.3	0.8
IQR i	1.45	1.98	8.65	3.25	2.3	1.7	1.7	2.55	2.3	2.4	2.1	1.5
Robust CV % i	8	8	7	7	6	9	6	9	8	6	7	5
Median f	13.9	17.9	95.4	32.9	27.9	13.7	20.8	20.9	21.1	28.9	22.3	23.3
Mean f	13.9	17.8	95	32.8	27.8	13.7	20.9	20.9	20.9	29	22.2	23.3
MAD f	0.8	1.05	4.2	1.4	0.8	0.5	0.75	1.2	1.15	1.2	1.25	0.65
IQR f	1.5	1.98	7.5	2.83	1.5	1	1.45	2.4	2.08	2.4	2.1	1.23
Robust CV % f	8	8	6	6	4	5	5	9	7	6	7	4
Outliers	1	0	3	3	4	5	4	2	1	2	1	4
Stragglers	0	0	0	1	4	1	1	0	0	0	0	3

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.

As indicated in Table 2., a diverse range of plant tissue sample types was presented to laboratories in 2022 from horticultural, ornamental, pastural and cropping sources. There were 9 plant tissue samples in the program that had been presented to laboratories at least once in the preceding years. Repeating some materials over subsequent years can be valuable in providing information about inter-laboratory measurement consistency and highlight improvement or otherwise in handling challenging plant tissue sample types. This notwithstanding, a small increase in the number of "new" samples introduced annually is planned for next year to enhance assessment of laboratory performance using previously unmeasured sample materials and their unique challenges.

While influenced by analyte concentrations an effective measure to evaluate improvement or otherwise in the ILPP performance of each test over time is to review the median coefficients of variation of the 12 samples after the removal of "outliers" and "stragglers" for each test method, henceforth referred to as the grand median robust %CV. Figure 4.1 presents grand median robust %CVs for each test in program years 2020, 2021 and 2022. They ranged from the consistently best performing tests in the ILPP, Carbon at 1% and Nitrogen at 3%, to the consistently poorest performing test methods, Nitrate-Nitrogen at 21%, Selenium at 23.5% and Silicon at 26.5%. The data for major elements in plant tissue shows a relatively close alignment between laboratories is continuing.

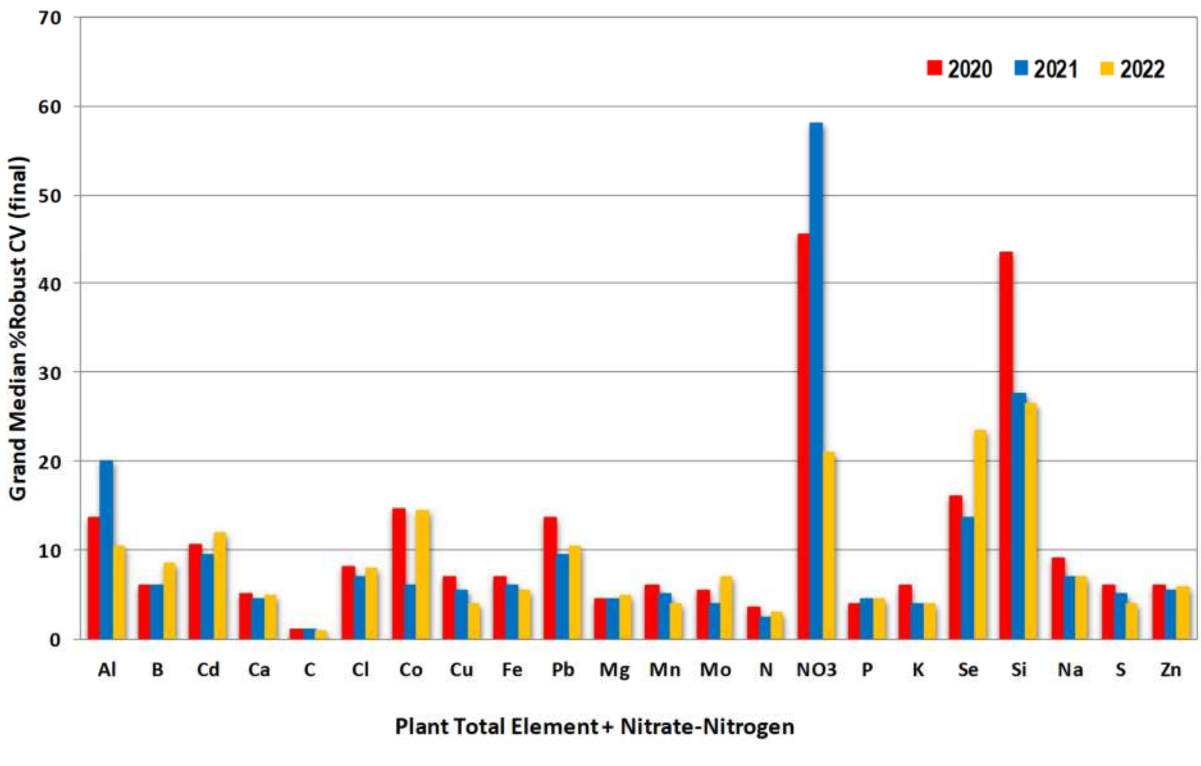

Figure 4.1. Grand median robust %CVs (final) for plant program years 2020 to 2022.

Lower inter-laboratory precision for Nitrate-Nitrogen in plant tissue samples may be expected given the program usually presents at least half the samples with concentrations < 25mg/kg, well below typical concentrations found in leaf petioles which are often a target sample type for this analyte in agriculture. Of the 12 samples presented to laboratories in 2022, only 5 plant tissue samples contained Nitrate-Nitrogen concentrations > 25mg/kg, compared with 4 samples for both the preceding years. The higher number of measurable values contributing to the data set using the typical techniques employed by laboratories for this testing is the most likely reason for the observed grand median robust %CV improvement for 2022 in Figure 4.1. Using only the performance data of the 5 samples with concentrations of Nitrate-Nitrogen > 25mg/kg, we may re-calculate a median robust %CV of 5%, representing reasonably good agreement for this test between laboratories for materials with more commonly measured Nitrate-Nitrogen levels.

Greater imprecision between laboratories for trace element measurements compared to the major elements continued this year, indicated by the greater number of statistical outliers for these tests. A higher grand median robust %CV for Cobalt and Selenium in Figure 4.1 was observed in 2022 than in 2021. While this year's Cobalt measurement performance is within the longer-term average, it is the highest grand median robust %CV for Selenium in 8 years. Most laboratories have reported results to the program using similar trace element analysis methodology with closed vessel microwave digestions and perhaps most importantly, analysis by ICP-MS. While the greater use of high specification equipment and inter-laboratory technique standardisation has provided notable improvement to inter-laboratory precision in the program, the inherent challenges of digestion recoveries for some plant species, intermittent within-laboratory contamination sources and measurement interference handling are likely to remain as important obstacles for individual laboratory testing accuracy for these low-level elements.

The non-certified "total" Silicon analysis performance is trending with high imprecision between laboratories. As mentioned in previous studies, this is likely to continue given the diversity of test methods known to be employed, especially by the number of laboratories that often under-recover this challenging to digest element if using an acid or acid/oxidant matrix alone without an alkaline solubilization step. Until a larger number of participants use a best practice and more robust methodology for this element, like sodium fusion or XRF analysis, this test will remain as uncertifiable in the program.

Appendix 1: List of laboratories (including contact details at the time) that participated in ASPAC's Plant ILPP in 2022, arranged by country

Name (Position)	*Facility*	*Street and / or Postal Address*	*Country*	*Email*
Stephen Ludvig (Managing Director)	Aglab Services	32 Wattlepark Avenue, Moolap, Victoria 3220	AUSTRALIA	service@agmin.com.au
Kraig Sutherland (Laboratory Manager)	AgVita Analytical	4 Thompsons Road, Via Frankford Highway, Devonport, Latrobe, Tasmania 7307	AUSTRALIA	ksutherland@agvita.com.au
Phoenix Vo	Analytical Laboratories and Technical Services Australia (ALTSA)	585 River Avenue, Merbein South, Victoria 3505	AUSTRALIA	phoenix.vo@altsa.com.au
Tim Thompson (Operations Manager)	Australian Precision Ag Laboratory	U 3, 11 Ridley Street, Hindmarsh, South Australia 5007	AUSTRALIA	tim@apal.com.au
Peter Keating (Managing Director)	Bioscience Pty Ltd	488 Nicholson Rd, Forrestdale, Western Australia, Western Australia 6112	AUSTRALIA	bioscience@biosciencewa.com
Chris Gendle (Chemist)	CSBP Ltd - Soil & Plant	2 Altona Street, Bibra Lake, Western Australia 6163	AUSTRALIA	chris.gendle@csbp.com.au
Nell Peisley (DNA Sequencing Coordinator)	CSIRO Analytical Chemistry Group - Agriculture	Clunies Ross Street, Acton, ACT 2601	AUSTRALIA	nell.peisley@csiro.au
Claire Wright (ICP Technical Officer)	CSIRO Land and Water	Entrance 4, Waite Road, Urrbrae, South Australia 5064	AUSTRALIA	Claire.Wright@csiro.au
Muhsen Aljada (Manager)	Department of Environment and Science - Chemistry Centre	Block A-Level 3, 41 Boggo Road, Joe Baker Street, Loading Dock 3, Dutton Park, Queensland 4120	AUSTRALIA	muhsen.aljada@des.qld.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)	35 Stirling Highway, Crawley, Western Australia 6009	AUSTRALIA	Michael.Smirk@uwa.edu.au
Stephanie Cameron (Operations Manager)	East West EnviroAg	82 Plain Street, Tamworth, NSW 2340	AUSTRALIA	Stephanie.c@eastwestonline.com.au
Stacey Hawkins (Supervisor - ASS/AMD)	Envirolab Services (WA) t/a MPL Laboratories	16 Hayden Court, Myaree, Western Australia 6154	AUSTRALIA	shawkins@mpl.com.au
Graham Lancaster (Laboratory Manager)	Environmental Analysis Laboratory	University Store, Military Road, East Lismore, NSW 2480	AUSTRALIA	Graham.Lancaster@scu.edu.au
James Stangoulis (Associate Professor)	Flinders University Plant Nutrition	Flinders University, Science and Engineering Store, Car Park 9, Physical Sciences Rd, Bedford Park, Adelaide, South Australia, South Australia 5042	AUSTRALIA	james.stangoulis@flinders.edu.au
Stephen Finlayson	Inorganic Chemistry Laboratory	Forensic and Scientific Services, 39 Kessels Road, Coopers Plains, Queensland 4108	AUSTRALIA	Stephen.Finlayson@health.qld.gov.au

Name (Position)	*Facility*	*Street and / or Postal Address*	*Country*	*Email*
Rabeya Akter (Senior Technical Officer)	Mark Wainwright Analytical Centre UNSW	Room B36 Chemical Science Building (F10), High Street, Kensington, NSW 2052	AUSTRALIA	r.akter@unsw.edu.au
Jack Milbank (Chief Innovation Officer)	Novum Lifesciences	1/5 Scotland Street, Bundaberg, Queensland 4670	AUSTRALIA	jack@novumlifesciences.com.au
Sally Granzin (Quality Assurance Coordinator)	NSW Department of Primary Industries	1243 Brunxner Highway, Wollongbar, NSW 2477	AUSTRALIA	sally.granzin@dpi.nsw.gov.au
John Morritt (Lab Supervisor)	Nutrien Ag Solutions Limited	Unit 2/34 Juna Drive, Malaga, WA 6090	AUSTRALIA	John.Morritt@Nutrien.com.au
Paul Kennelly (Laboratory Manager)	Nutrient Advantage Laboratory Services	8 South Road, Werribee, Victoria 3030	AUSTRALIA	paul.kennelly@incitecpivot.com.au
Sarah Houston (Laboratory Manager)	Nutri-Lab Agricultural Labs	Lot 14 Troy Drive, Goondiwindi, , Queensland 4390	AUSTRALIA	sarah@nutrilab.com.au
Rob Cirocco (Manager)	Phosyn Analytical	1/60 Junction Road, Burleigh Heads, Queensland 4220	AUSTRALIA	rcirocco@phosyn.com.au
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Appendix 2: Homogeneity data and statistical assessments* for Total Plant N% (Dumas N) on the 12 test plant samples in 2022.

Sample Name		ASP 2202-1	ASP 2202-2	ASP 2202-3	ASP 2202-4	ASP 2205-1	ASP 2205-2	ASP 2205-3	ASP 2205-4	ASP 2208-1	ASP 2208-2	ASP 2208-3	ASP 2208-4
Sub-sample													
1	Rep 1	1.97	1.74	4.24	3.94	2.30	1.46	3.55	1.97	1.21	5.33	2.03	1.53
	Rep 2	1.09	1.73	4.21	3.95	2.31	1.42	3.59	1.98	1.23	5.33	2.02	1.55
2	Rep 1	1.02	1.75	4.25	3.95	2.32	1.46	3.58	1.96	1.21	5.34	1.99	1.54
	Rep 2	1.08	1.73	4.23	3.94	2.33	1.43	3.58	1.96	1.23	5.36	2.03	1.55
3	Rep 1	1.03	1.74	4.24	3.94	2.29	1.44	3.57	1.96	1.23	5.36	2.04	1.54
	Rep 2	1.01	1.74	4.23	3.94	2.30	1.43	3.58	1.97	1.22	5.35	2.03	1.55
4	Rep 1	1.06	1.74	4.22	3.94	2.34	1.42	3.56	1.96	1.23	5.39	2.03	1.55
	Rep 2	1.01	1.73	4.25	3.95	2.33	1.42	3.57	1.97	1.22	5.38	2.02	1.55
5	Rep 1	1.06	1.71	4.25	3.96	2.33	1.42	3.56	1.97	1.24	5.37	2.03	1.54
	Rep 2	1.12	1.74	4.24	3.95	2.31	1.42	3.57	1.97	1.24	5.37	2.02	1.54
6	Rep 1	1.06	1.73	4.23	3.94	2.30	1.43	3.57	1.96	1.23	5.39	2.03	1.55
	Rep 2	1.02	1.74	4.24	3.96	2.31	1.43	3.56	1.97	1.22	5.39	2.03	1.55
7	Rep 1	1.09	1.73	4.23	3.95	2.30	1.42	3.56	1.97	1.23	5.36	2.02	1.55
	Rep 2	1.12	1.73	4.26	3.95	2.34	1.43	3.57	1.97	1.22	5.35	2.02	1.55
8	Rep 1	1.01	1.73	4.23	3.96	2.30	1.41	3.56	1.97	1.23	5.36	2.02	1.54
	Rep 2	1.08	1.75	4.26	3.96	2.27	1.42	3.57	1.96	1.25	5.37	2.03	1.55
9	Rep 1	1.09	1.75	4.26	3.96	2.31	1.43	3.56	1.97	1.24	5.38	2.03	1.55
	Rep 2	1.01	1.74	4.25	3.95	2.33	1.43	3.56	1.97	1.23	5.37	2.03	1.54
10	Rep 1	1.05	1.75	4.16	3.96	2.32	1.42	3.56	1.97	1.25	5.34	2.05	1.55
	Rep 2	1.07	1.74	4.25	3.95	2.31	1.42	3.56	1.97	1.26	5.35	2.03	1.57
Mean		1.05	1.74	4.24	3.95	2.31	1.43	3.57	1.97	1.23	5.36	2.03	1.55
Analytical SD		0.00164	0.00011	0.00065	0.000036	0.000186	0.00014	0.0001	0.00003	0.0001	0.00004	0.0001	0.0001
Sampling SD		0	0	0	0.000009	0.000114	0.00002	0	0.000001	0.0001	0.0004	0.00003	0
SD proficiency data		0.03	0.06	0.09	0.12	0.05	0.05	0.13	0.06	0.07	0.11	0.07	0.06
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 2022.

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) for the preparation, extraction and/or digestion techniques used for each plant test reported in this ILPP. A separate code (see Table 6) is required to identify the relevant instrumental 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 HClO4	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 or analytical finishes (IA-MIC) for the instrumental or analytical finishes associated with each plant test reported in this ILPP. A separate code (see Table 5) is used to identify the relevant preparation, extraction or digestion technique.

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

Appendix 5: “Raw” 2022 plant data reported by laboratories for 12 samples across three “rounds”

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Aluminum (mg/kg)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-23	8390		12.9	††	413	††	279		40.3		0.917		0.806		459		2.37		51.1	†	365		461	
8888	DE-23	7760		4.14		397	††	291																	
10156	GI-23	9300	††	6.22		412	††	276		35.3		1.4		0.9		477				37		368		468	
10173	DN-24	7360		4.15		346		258		39.7		3.48		2.25		485		1.15		44.7		373		470	
11079	DE-23	7320		2.97		308		228		36.9		2.61		3.15		372		2.08		40.8		318		420	
20204	GJ-23	7550		2.5		309		242		34.8		2.32		2.19		422		2.64		39.7		330		406	
21043	GJ-23	7770		7.35		319		230																	
21088	DE-23	6570	††	10		310		240		32		5.3	†	1.5		444		4.5	††	44.5		390		360	
21100	DE-24	7190		7.88		163	††	178	††	34.9		1.98		1.92		349		1.42		25.3	††	185	††	313	††
21178	DE-23	7300		3		140	††	160	††																
21229	GI-23	8070		3.52		314		259		63.2	††	2.8		4.76	††	372		1.73		42.7		334		434	
21230	DE-23	6330	††	2.17		288		211		29.9		1.77		2.3		371		1.47		34		288		372	
21232	DE-23	7460		5.41		375	†	272		36.1		1.48		2.29		462		5.02	††	43.5		337		425	
50004	DE-23	8180		6.36		507	††	319	††	50.5	††	8.75	††	2.14		411		0.905		40.6		333		380	
50005	DE-23	7710		4.9		306		271		33.6		2.64		1.91		358		2.04		42.7		311		409	
50011	DE-23	7910		5.68		311		253		39.8		2.11		1.83		400		1.44		35.2		335		483	
50012	DN-23	7840		1.74		295		247		34.1		1.44		4.34	†	375		1.52		47.7		358		429	
50014	DE-23	7990		2.07		333		248		53.3	††	2.83		2.03		427		2.6		70	††	341		420	
50017	DE-23	7470		16.9	††	324		242		39.5		2.61		2.89		446									
50018	DE-23	7980		3.72		302		235		31.2		2.47		2.02		368		1.96		42.3		324		408	
50020	GI-23	9000	††	9.67		237	†	281																	
50024	GJ-23	7630		4.94		291		223		54	††	1.1		1.2		415		0.36		59	††	355		427	
50027	DN-24	8000		2.92		338		245		35.3		3.7		2		421		2.5		39.1		339		440	
50029	AD-23	7560		3.56		324		242		34.4		6.51	††	2.9		378		2.51		37.9		324		389	
52283	GJ-23	7630		2.06		312		226		29.5		2.41		1.94		391		2.19		40.2		291		384	
52491	GI-23	7500		22.3	††	176	††	199		30.3		4.29		4.09	†	237	††	4	††	31.5		174	††	325	
52495	GI-24	7940		8.14		184	††	199		38.9		5.46	†	3.96	†	331									
52508	AE-23									23.8		3.5		1.7		262	††								
52565	DN-23	5860	††	6.74		241	†	223		30		3		3		315		1.67		34		320		394	
52610	DE-24	8000		1.45		240	†	215																	
52636	DE-23	7350		56	††	289		234		30.2		3.24		3.67		315		0.0001	††	39.7		301		332	
52874	GI-23	6810	†	4.8		181	††	172	††	15.9	††	2.16		2.5		291	†								

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Boron (mg/kg)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-23	52.1		1.28		15.6		4.91		23.4		0.971		7.43		11.1		0.96		43		83.7		13.2	
8888	DE-23	47.6		0.212	††	13.9		3.82		21.6		0.269	††	5.94		9.59		1.03		43.8		84.5		13.2	
10156	GI-23	50.9		1.44		15.2		5.4		24.1		0.4	††	6.9		10.6				47.8	††	91.8		14	†
10173	DN-24	45		1.31		13.6		4.36		21.3		0.908		6.42		9.99		0.561		39.5		76.7		13	
11079	DE-23	45.5		1.15		14.8		4.79		20.6		0.68		5.95		9.39				36.9	††	73.3		10.5	††
20204	GJ-23	34.6	††	1.15		13.9		2.51	†	30.6	††	1.15		6.96		8.06		5.15	††	40.6		55.9	††	12.4	
21043	GJ-23	91.3	††	11.4	††	24.9	††	19.1	††																
21088	DE-23	46		1		13		1	††	20		1		6		10		2.2	††	40		83		13	
21100	DE-24	49		10.1	††	15.6		7	†	23.1		1.04		8.21	††	11.1		3.39	††	44.3		76		12.9	
21178	DE-23	46		1		13		4																	
21229	GI-23	53.1		1.25		15.3		4.41		24.2		0.976		6.92		10.6		0.709		43.2		81.1		12.8	
21230	DE-23	37.3	††	0.233	††	10.4	††	3.03		16.8	††	0.466	††	4.8	††	7.4	††	0.466		32.9	††	63.8	††	9.64	††
21232	DE-23	47.9		0.588	†	14.2		4.42		21.2		0.883		6.09		9.42		0.673		39.9		75.7		12	†
50004	DE-23	56.2		1.47		17.6		5.54		24.1		1.12		7.06		10.8		0.575		39.8		75.8		13	
50005	DE-23	43.2		2.56	††	14		5.32		20.4		0.871		6.6		9.92		0.792		43.3		77.9		13.2	
50008	AD-23	47.4		1.44		13.2		5.2																	
50011	DE-23	50.4		1.34		14.3		4.77		22.3		1.04		6.74		9.81		0.78		40.2		78.2		12.5	
50012	DN-23	43.7		2.16	††	13		0.295	††	25.9		1.33		6.05		11.1		0.925		52.2	††	92.9		14.6	††
50014	DE-23	52.1		1.1		15.8		4.83		23.2		0.62		6.63		10.1		0.65		44.1		83.1		13.1	
50017	DE-23	57		1.56		15.2		6.3		32.8	††	1.11		6.64		12.1	†								
50018	DE-23	49.2		1.89	†	14		4.31		22.8		1.01		6.74		9.81		0.688		43.8		80.1		12.8	
50020	GI-23	60.2	††	2.5	††	18.9	††	6.49																	
50024	DE-23	50.3		1.53		16.5		5.65		20.3		1.1		6.2		10.6		0.55		43.6		84.3		14.4	††
50025	GJ-23	43		10.9	††	21.6	††	12.4	††	23.4		9.71	††	12.8	††	14.7	††	10	††	42		69		19.2	††
50027	DN-24	48.6		1.01		14.7		4.45		22.6		0.86		6.7		10		0.83		42.4		84		12.9	
50029	AD-23	51.8		1.26		15.8		6.22		25.7		1.35		6.48		11.1		1.37	†	43.8		88.6		13.8	†
50032	DE-30	50.5		1.58		24.3	††	1.75	††	31.6	††	0.9		15.5	††	21.7	††								
52283	GJ-23	49.1		1.24		14.9		6.12		33.7	††	1.16		6.64		9.33		0.727		42.5		82		13	
52491	GI-23	51.1		1.12		15.1		4.67		22.2		0.256	††	5.53		9.17		0.447		44.5		86.9		13.3	
52494	GG-23	51		1.7		16.1		5.5		22.4		1.6	††	7.1		10.6		0.6		41.4		77.4		11.6	††
52495	GI-24	54.6		1.38		14.9		4.68		24.8		0.737		7.41		11.1									
52508	AE-23									16.9	††	0.3	††	4.75	††	10									
52565	DN-23	42.2		1.04		13		4.9		20.1		0.858		4.7	††	7.25	††	1.13		42.3		79.7		11.2	††
52636	DE-23	53.9		1.1		17.5		7.1	†	20.1		0.858		4.7	††	7.25	††	0.584		42.7		78.1		11.1	††
52874	GI-23	41.3		0.25	††	7.1	††	0.25	††	18.1		0.5	†	2.6	††	5.9	††								

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Cadmium (µg/kg)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-24	12.3		1.28		1110		45.8		313		0.318		18.5		65.6		16.5		9.4		0.232		147	
10156	GI-23					1200		50		337						54		11.1	††	17.7				140	
10173	DN-24	19.4		7.17		1130		10.3	††	333		0.76		19		66.3		20.7		0.86		0.01		160	
11079	DE-23			3.24		1070		30.5	††	271				18.4		74.5		15.3		14.2				141	
20204	GJ-23	15.1		3.5		1050		67.1	††	279		1		19.3		55.8		17.3		15		16.5	††	145	
21088	DE-23	40	††	30	††	880		40		260		10	††	10	††	60		20		40	††	10	††	140	
21100	DE-24	12		2.28		1010		40.6		348		7.36		23.2		74.7		21.3		31.4		4.1		152	
21178	DE-24	21		8		1100		44																	
21229	GI-24	18.2		1.23		1140		46.5		322		2.47		20.7		75		18.2		11		1.98		142	
21230	DE-24	26.3		8.4		871		46.4		314		4.53		28.5	††	71.5		13.5	††	44.1	††	2.63		108	††
50004	DE-24	12		4.36		881		33.7	††	289		1.68		20.1		60.2		19.4		34.5		2.6		158	
50005	DE-24	14.5		4.22		1030		23.6	††	256		45.7	††	17.9		60.1		19.1		13.2		2.11		140	
50011	DE-24	15.6		3.43		1050		43.4		298		1.04		17.8		60		16.1		10.2		1.41		137	
50012	DN-24	12		10		1340	††	50		513	††	7		32	††	91	††	19		23		3		281	††
50014	DE-24	17.2		3.7		1140		43		345		5.27		24		74		27	††	14		4.76	††	146	
50018	DE-24	15.2		4.01		901		14.6	††	283		3.96		19.6		51.2		18.2		12.1		1.92		146	
50020	GI-23	100	††	100	††	686	††	100	††																
50024	GJ-24	15.8		3.3		1060		42.4		298		2.72		17.8		66.6		18.3		22.4		0.1		151	
50027	DN-24	11.3		1.7		1060		44		299		1		15		65		17		1		2		144	
52495	GI-24	15.7		3.12		1170		44.9		338		1.44		21.1		69									
52565	DN-24	299	††	105	††	287	††	922	††	247		5		17		59.5		17.5		18.3		1.6		143	
52610	DE-24	17		4.3		1100		40																	

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Calcium (%w/w)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-23	1.54		0.05		1.5		0.52		1.57		0.023		0.041		0.802		0.008		4.73		3.1		0.634	
8888	DE-23	1.46		0.051		1.38		0.487		1.49		0.022		0.037		0.736		0.008		4.69		3.19		0.626	
10156	GI-23	1.46		0.052		1.47		0.533		1.53		0.025		0.0397		0.774		0.0084		4.54		3.04		0.636	
10173	DN-24	1.33		0.054		1.32		0.47		1.56		0.028	††	0.039		0.775		0.008		4.22	†	2.82		0.59	
10181	GF-23	1.49		0.056		1.45		0.502		1.52		0.023		0.038		0.74		0.013	††	4.82		3.15		0.666	
11079	DE-23	1.34		0.052		1.43		0.596	††	1.44		0.020		0.0365		0.727		0.00867		4.1	†	2.89		0.61	
20204	GJ-23	1.45		0.054		1.32		0.57	†	1.59		0.025		0.04		0.742		0.098	††	4.17	†	2.69	†	0.625	
21043	GJ-23	1.4		0.05		1.39		0.47																	
21088	DE-23	1.3		0.049		1.2	††	0.44		1.42		0.022		0.037		0.72		0.0093		4.43		3.03		0.65	
21100	DE-24	1.5		0.067	††	1.48		0.543		1.56		0.028	††	0.0451		0.833	††	0.00932		4.89		3.07		0.656	
21178	DE-23	1.47		0.05		1.4		0.49																	
21190	AD-13									1.45		0.001	††	0.00049	††	0.766		0.011	†	4.65		3.1		0.641	
21229	GI-23	1.53		0.052		1.47		0.518		1.58		0.022		0.0387		0.746		0.00843		4.39		3.01		0.637	
21230	DE-23	0.881	††	0.021	††	1.29		0.381	††	0.855	††	0.008	††	0.0202	††	0.513	††	0.00306	††	4.1	†	2.11	††	0.439	††
21232	DE-23	1.47		0.053		1.4		0.517		1.5		0.024		0.04		0.742		0.01		4.17	†	2.83		0.609	
50004	DE-23	1.51		0.053		1.47		0.586	††	1.44		0.023		0.039		0.76		0.008		4.62		3.02		0.632	
50005	DE-23	1.52		0.081	††	1.4		0.511		1.52		0.022		0.0385		0.767		0.00995		4.67		3.1		0.64	
50008	GJ-23	1.49		0.051		1.45		0.502																	
50011	DE-23	1.55		0.056		1.38		0.504		1.55		0.024		0.04		0.744		0.009		4.63		2.9		0.618	
50012	DN-23	1.53		0.053		1.47		0.528		1.66		0.023		0.0371		0.721		0.00887		4.85		3.25		0.688	†
50014	DE-23	1.46		0.052		1.46		0.51		1.56		0.023		0.041		0.776		0.007		4.51		2.98		0.632	
50017	DE-23	1.4		0.048		1.31		0.46		1.39		0.023		0.039		0.651	††								
50018	DE-23	1.51		0.053		1.4		0.487		1.59		0.022		0.039		0.776		0.00963		4.68		3.01		0.64	
50020	GI-23	1.74	††	0.048		1.74	††	0.65	††																
50024	GJ-23	1.48		0.057		1.4		0.51		1.56		0.023		0.041		0.857	††	0.0084		4.56		3.04		0.65	
50025	GJ-23	1.44		0.057		1.38		0.471		1.38		0.028	††	0.0424		0.731		0.012	††	4.29		2.92		0.654	
50027	DN-24	1.41		0.053		1.38		0.486		1.57		0.025		0.0408		0.761		0.0106	†	4.69		3.09		0.651	
50029	AD-23	1.45		0.053		1.33		0.499		1.55		0.022		0.0397		0.732		0.00976		4.63		3.18		0.621	
50032	DE-11	1.41		0.05		1.49		0.52		1.34		0.023		0.026	††	0.616	††								
52283	GJ-23	1.44		0.051		1.39		0.471		1.34		0.024		0.041		0.799		0.007		4.67		3.25		0.63	
52387	DE-14	1.33		0.042	††	1.36		0.431	†	1.51		0.21	††	0.0245	††	0.73		0.009		4.83		2.47	††	0.53	††
52491	GI-23	1.39		0.051		1.37		0.486		1.51		0.021		0.0369		0.748		0.008		4.6		3.03		0.648	
52494	GG-23	1.42		0.05		1.36		0.489		1.4		0.021		0.036		0.701		0.008		4.14	†	2.77	†	0.577	†
52495	GI-24	1.51		0.054		1.64	††	0.545		1.63		0.024		0.0409		0.845	††								
52495	GI-36																	0.0133	††	3.19	††	2.27	††	0.528	††
52508	AE-23									1.19	††	0.228	††	0.0342		0.737									

52565	DN-23	1.17	††	0.05		1.1	††	0.43	†	1.38		0.021		0.0363		0.666	†	0.007		3.95	††	2.57	††	0.526	††
52610	GG-23	1.37		0.032	††	1.32		0.461																	
52636	DE-23	1.49		0.053		1.4		0.504		1.38		0.021		0.0363		0.666	†	0.007		3.84	††	2.53	††	0.52	††
52874	GI-23	1.39		0.048		1.37		0.489		1.47		0.022		0.036		0.753									

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Carbon (%w/w)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	CA-37	45.6		46.2		40.3		43.8		49		43.6		43.8		44.3		43.8		36.7		44.3		43.9	
10156	CA-37									48.4		43.3		43.6		44.1		44.1		36.8		44.3		43.8	
10173	CA-37																	42.9		37.9	††	44.9		44.2	
10181	CA-37	46.2		47.1		40.7		44.4		49.3		44.3		44.5		44.7		44.6		36.9		45		44.2	
11079	CA-37																	44.4		36.6		44.4		43.5	
20204	CA-37	45.6		45.5		40.2		44.5		49		42.5		42.6		43.6		42		35.4	†	44.1		43.3	
21100	CA-37	45.6		46.5		40.6		43.9		49.5		44.4		45		45.2		44.1		36.8		44.3		43.6	
21229	CA-37	45.3		46.2		40.2		43.3		49.7		44.7		45		44.6		43		36.4		43.6		43.4	
21230	CA-37	44.4		45.3		39.8		43.2		48.4		43.1		43.6		44.1		42.8		35.7	†	43.7		43.2	
21232	CA-37	42.5	††	43.2	††	37.6	††	42.2	†	45.8	††	40	††	39.5	††	40.7	††	39.3	††	33.8	††	41.2	††	40.5	††
50004	CA-37	45.6		46.2		40.9		44.1		48.6		43.6		43.5		44.3		42.7		36.6		43.9		43.3	
50005	CA-37	45.6		45.7		40.5		43.9		49.5		43.1		43		44.2		43.2		37		44.6		43.5	
50008	CA-37	46.1		46.9		40.8		44.4																	
50011	CA-37	45.8		46.2		41.1		44.7		49.1		43.8		44.1		44.7		44.4		36.8		44.9		43.9	
50012	CA-37	41.7	††	42.1	††	37.1	††	40.9	††	49.5		44.4		44.4		45		42.1		35.9		43.4		42.7	
50014	CA-37	45.4		46.3		40.2		43.6		48.8		43.5		43.8		44.1		44.5		36.1		44		44.2	
50017	CA-37	44.6		45.1		40.2		43		48.9		42.3		42.6		43.3		44.8		21.4	††	45.2		44.4	
50018	CA-37	45.6		46.9		41.1		44.2		49.6		43.8		43.6		44		43.6		36.8		44.2		43.6	
50020	CA-37	46.2		46.9		41		44.2																	
50024	CA-37	45.6		46.5		40.6		44		49.1		43.9		44.3		44.6		44.1		36.8		44.5		43.9	
50027	CA-37	45.7		46		40.4		44.1		48.8		42.7		42.4		43.7		41.9		36.1		44.1		42.9	
50029	CA-37	44.5		44.6		39.7		43.5		48.1		42		42.2		42.7		42		35.8	†	43.5		42.7	
52283	CA-37	45.7		46.8		40.3		44.4		50.3		44.9		45.1		45.7		43.3		36.7		46.1	††	43.6	
52491	CA-37	44.5		44.6		39.6		42.8		47.6		41.7		41.6		42.6		40.3		34.9	††	42.3	††	41.4	††
52495	CA-37	45.7		46.1		40.7		44.1		53.8	††	45.4		46.5		44.1		46.4		38.6	††	47.1	††	46.1	††
52565	CA-37	44.9		44.5		39.2	†	40.8	††	47.6		41.3		41.2		39.9	††	42		36.3		44.4		42.9	
52636	CA-37	42	††	43	††	38	††	39	††	47.6		41.3		41.2		39.9	††	41.3		35.1	††	43.7		42.3	

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Chloride (mg/kg)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	BA-32	106		473		2810		1370		888		1310		241		10800		314		2040		1050		8510	
10173	BA-27	150		588		2980		1380		903		1340		268		11000		3400	††	2050		1100		8480	
20204	BB-27	250		465		2810		1190		560		1200		357		9410		325		2020		2570	††	8180	
21088	BB-31	1140	††	510		3880	††	1410		1970	††	1230		620	††	10300		180		2260	††	2760	††	8010	
21100	BB-31	67.9		388		2340		1330		2630	††	1550	††	1560	††	15600	††	217		2690	††	2810	††	7210	†
21229	BB-31	129		377		2610		1330		886		1270		282		11200		302		1970		1140		8300	
21230	BB-28	62.8		286		2040	†	1270		645		1020		156		11400		197		1590	††	756	†	8230	
21232	BB-31	500	†	500		2000	†	1120	†	1000		1170		500		8500	††	0.05	††	0.15	††	0.1	††	0.725	††
50005	BB-32	310		1120	††	2710		1220		929		1140		358		7140	††	309		2010		1090		8200	
50011	BB-31	312		574		2540		1280		867		1030		253		8950		350		1820	†	1030		8160	
50012	BB-31	305		404		2790		1320		819		1170		251		11400		237		1960		1150		8610	
50014	BB-31	300		500		3000		1440		1000		1300		200		11400		400		2200	†	1300		9300	†
50018	BB-32	182		512		2750		1350		850		1230		294		10500		316		1950		1090		8210	
50020	BA-31	2670	††	384		3510	†	1200																	
50027	BB-32	70		440		2700		1430		700		1300		300		10900		270		1940		940		8630	
50027	BB-27	70		440		2700		1430		700		1480	††	420		11000		300		2300	††	1200		8230	
50029	BB-31	1610	††	402		3920	††	1340		2220	††	1120		474		11000		317		2290	††	2680	††	8710	
50032	BB-31	120		345		1920	†	1020	††	542		1130		845	††	10800									
52494	BA-32	125		371		2560		1300		774		1150		220		9970		68.5	†	1710	††	877		7570	
52565	BA-31	946	††	872	††	2220		1140		1260	†	957		432		8770	†	668	††	2000		1460	†	6500	††
52874	BB-28	126		413		2500		1360		867		1280		256		10800									

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Cobalt (µg/kg)																							
		February 2022 (Round 2)								May 2022 (Round 5)								August 2022 (Round 8)							
		ASP 2202-1		ASP 2202-2		ASP 2202-3		ASP 2202-4		ASP 2205-1		ASP 2205-2		ASP 2205-3		ASP 2205-4		ASP 2208-1		ASP 2208-2		ASP 2208-3		ASP 2208-4	
22	DE-24	10.7	††	15.8		186		107		26.3		3.55		45.7		245		9.47		31.2		74.7		402	
8888	DE-24	20.3				243	††	128		29.1				49.6		235		10		39.9		97.6		440	
10156	GI-23	54.5	††	17.5		202		92.4		23.9		5		46.5		236		7.3		26.7		71.4		368	
10173	DN-24	20.1		17.3		193		97.7		39.3		2.7		46.1		215		7.6		29		101		373	
11079	DE-23															225				35.9		98.4		354	
20204	GJ-23	23		15.8		192		88.8		38.3		7.6		43.6		234		13.5		36		326	††	382	
21088	DE-23	94	††	10		320	††	160	††	120	††	27	††	80	††	270		80	††	130	††	190	††	530	††
21100	DE-24	14.9		9.01		180		79.1		14.7		0.1		32.4	††	226		1	††	2	††	46.9	††	458	
21178	DE-24	20		11		160		82																	
21229	GI-24	21.7		22.8		176		73.2		24		6.47		48.9		225		8.8		32.3		77.5		399	
21230	DE-24	49.4	††	44	††	206		121		68.3	††	40.7	††	82.8	††	277	††	35.9	††	55.8	††	98.4		379	
50004	DE-24	21.2		15.6		218		106		33.2		11.3		47.5		244		10.5		49.6		142	††	562	††
50005	DE-24	21.8		26.1		172		108		32.7		6.93		50.1		203		12.3		39.6		79.3		399	
50011	DE-24	23.1		19.2		198		99.1		30.6		5.86		43.5		216		10.3		36.4		82.5		397	
50012	DN-24	15		22		210		122		57	††	61	††	75	††	332	††	3	††	31		101		653	††
50014	DE-24	18		15.3		195		95.3		34		6.53		48		236		8.64		27		75		384	
50018	DE-24	19.2		4.02	††	156		69.2		65.8	††	5.6		46.5		248		10.6		37.8		80.1		402	
50020	GI-23	1000	††	1000	††	1000	††	1000	††																
50024	GJ-24	18.4		12.5		189		91.1		27.6		1.9		40.4	††	218		0.8	††	14		63		341	
50027	DN-24	19		15		180		91		33		8.6		46		238		12		35		77		407	
50029	AD-23	26.3		13.6		194		114		32.5		9.78		54.1		260		8.25		28.8		83.3		397	
52495	GI-24	23.3		16.8		179		87.5		36.7		3.65		48.7		243									
52565	DN-24	200	††	183	††	310	††	252	††	50.1		25.1	††	61.8	††	229		9.18		25.4		71		375	
52610	DE-24	32	††	16		210		100																	

Plant sample identification and values for

2022: Total Copper (mg/kg)

Lab. Code #	Method Codes	February 2022 (Round 2)								May 2022 (Round 5)								August 2022 (Round 8)							
		ASP 2202-1		ASP 2202-2		ASP 2202-3		ASP 2202-4		ASP 2205-1		ASP 2205-2		ASP 2205-3		ASP 2205-4		ASP 2208-1		ASP 2208-2		ASP 2208-3		ASP 2208-4	
22	DE-23	4.83		4.19	†	9.35		8.28		62.7		5.96		6.11		6.48		4.19		16		129		11.8	
8888	DE-23	4.54		4.05		10	†	8.42		63.8		5.94		6.06		6.58		4.28		15.5		147	††	12.3	
10156	GI-23	4.11		3.86		8.82		7.64		53.9		5.7		5.4		6.5		4.4		14.6		122		11.5	
10173	DN-24	3.8	†	3.57	††	8.4		7.33	†	58.3		5.02	†	5.54		5.4		4.14		13.9	††	119		11	
11079	DE-23	4.44		3.98		9.15		7.83		57.9		5.43		5.32		6.03		4.01		16		127		10.4	
20204	GJ-23	4.51		3.95		9.1		8.91	††	38.6	††	5.7		5.93		5.92		4.5		15.1		112		12.1	
21043	GJ-23	4.15		3.94		8.74		7.3	†																
21088	DE-23	5	†	3.7	†	8.3		7.9		55		5.8		5.5		6.1		4.5		16		140		12	
21100	DE-24	4.56		4.06		9.26		8.07		62.7		6.21		6.08		6.67		4.49		15.7		129		12.2	
21178	DE-23	4.2		3.9		8.9		7.7																	
21190	AD-13									61.2		8.61	††	10.8	††	8.29	††	1.72	††	19.2	††	127		12.8	
21229	GI-23	4.46		3.94		9.15		7.97		63.7		5.93		6.04		6.23		4.32		15.4		129		11.3	
21230	DE-23	3.7	††	3.37	††	7.57	††	6.5	††	52		4.86	††	4.83		0.17	††	6.83	††	16.2		115		12.9	
21232	DE-23	4.39		3.93		8.85		8.42		58.3		5.28	†	5.4		5.67		3.88	†	14.7		121		10.9	
50004	DE-23	4.34		3.92		9.47		7.99		64.5		5.77		5.68		6.17		4.23		17.6	††	136		12.2	
50005	DE-23	4.73		6.18	††	9.73		8.97	††	55.5		5.73		5.66		5.8		4.42		15.8		122		11.4	
50008	GJ-23	4.48		4.41	††	9.14		8.04																	
50011	DE-23	4.62		4.27	†	8.9		8.09		60.3		6.13		6		6.14		4.35		14.2		123		12.1	
50012	DN-23	4.22		3.89		8.76		7.85										4.76	†	17.2		138		12.9	
50012	DN-24									84.4	††	8.55	††	7.96	††	8.28	††								
50014	DE-24	4.43		4.05		8.94		7.54		61.3		5.7		5.79		6.06		4.4		14.3		121		10.8	
50017	DE-23	4.43		3.88		8.81		7.88		34.9	††	6.23		6.02		10.2	††								
50018	DE-23	4.47		4.06		9.18		8.06		58.4		5.73		5.78		5.83		4.31		15.6		130		11.4	
50020	GI-23	5.37	††	3.95		11.6	††	10.3	††																
50024	GJ-23	4.73		3.99		10.1	†	7.99		63.6		5.68		5.51		6.77		4.37		17.2		137		12.1	
50025	GJ-23	3.63	††	3.9		7.73	††	7.07	††	57.5		6.45	†	6.06		5.85		6.1	††	14.6		118		13.5	
50027	DN-24	4.33		3.78		9.08		7.76		58.7		5.98		5.66		6.06		4.36		15.2		128		11.6	
50029	AD-23	5.01	†	3.67	†	8.3		9.33	††	65.6		6.48	†	6.33		6.63		3.93		16.7		135		11	
50032	DE-11	4.95	†	3.8		8.95		7.8		34.5	††	5.7		4.95		5.8									
52283	GJ-23	4.59		5.23	††	9.09		8.07		34.6	††	6.5	†	6.05		5.82		4.19		18.3	††	131		11.4	
52387	DE-11	4.26		3.13	††	8.66		7.82		59		5.83		5.65		6.11		5.23	††	16.1		128		12.1	
52491	GI-23	11.3	††	6.16	††	13.3	††	11.3	††									3.16	††	15.2		147	††	11.3	
52494	GG-23	4.4		3.89		9.4		7.8		58.8		4.69	††	4.8		4.99	†	4		15.3		122		10.8	
52495	GI-24	4.54		4.23	†	9.66		8.54	†	70.9	†	5.94		6.16		6.4									
52495	GI-36																	6.17	††	17.5	††	110	††	13.3	
52508	AE-23									47.4	†	2.7	††	4.85		5.9									

52565	DN-23	4.44		3.84		7.7	††	7	††	56.6		4.68	††	4.7		4.86	††	4.21		15.7		127		10.9	
52610	DE-24	4.25		3.9		9.05		7.95																	
52636	DE-23	6.5	††	4.6	††	9.4		8.4		56.6		4.68	††	4.7		4.86	††	4.05		15.7		123		10.7	
52874	GI-23	2.2	††	2.5	††	7.2	††	7.6		52.9		5	†	5		5	†								

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Iron (mg/kg)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		ASP 2202-2		ASP 2202-3		ASP 2202-4		ASP 2205-1		ASP 2205-2		ASP 2205-3		ASP 2205-4		ASP 2208-1		ASP 2208-2		ASP 2208-3		ASP 2208-4	
22	DE-23	53.4		30		364		226		54.7		38.7		41.7		348		11.3		104		202		361	
8888	DE-23	54.4		29.7		349		238		51.1		36.4		40.7		335		8.79		102		207		354	
10156	GI-23	49.2	†	24.3		336		190		57.4		42.3		43.9		383	††	10		102		197		329	
10173	DN-24	56.7		28.2		345		197		53.6		35.8		39.8		329		10.8		103		202		341	
11079	DE-23	56		30		331		233		56.2		36.7		41.1		329		13.3		98.8		202		360	
20204	GJ-23	57.9		31.4		346		354	††	57.4		44.5		40		353		11.1		114	†	205		339	
21043	GJ-23	55.7		28.2		350		198																	
21088	DE-23	55		30		300	††	200		53		37		37		340		11		100		210		230	††
21100	DE-24	68.6	††	38.1	††	333		212		75.9	††	67.2	††	64.7	††	363		38.4	††	134	††	195		296	
21178	DE-23	53		27		300	††	180																	
21190	AD-13									34.8	††	24.8	††	24.9	††	284		14		105		173	††	257	††
21229	GI-23	60.1		31.2		337		206		55.8		39.9		43.1		311		11.6		105		204		341	
21230	DE-23	17.2	††	17.9	††	399	††	205		43.4	††	23.4	††	29.8	††	309		6.19	††	127	††	211		345	
21232	DE-23	58.4		30.5		362		220		55.7		39.8		40.1		352		15.7	††	109		206		354	
50004	DE-23	53.2		29.7		350		218		53.9		49.1	††	39.4		325		10.5		101		195		336	
50005	DE-23	52.6		5.64	††	312	†	176		56.9		38.4		39.5		338		12		110		208		340	
50008	GJ-23	53.2		28.6		331		193																	
50011	DE-23	61.4		31.8		338		221		57.2		41.5		43.6		324		12.3		103		207		360	
50012	DN-23	73.3	††	28.7		345		210		60.4	†	45.6		36.7		313		11.7		119	††	224	†	363	
50014	DE-23	57.8		29.7		367		225		55.6		39.3		42		344		12.9		105		209		339	
50017	DE-23	57.5		26.4		335		211		49.7		43.1		40.8		371									
50018	DE-23	56.4		30.2		323		212		51.4		38.4		39.8		317		11.6		104		206		342	
50020	GI-23	51.1		187	††	375	††	219																	
50024	GJ-23	59.6		36.5	†	373		229		61	†	42.5		45.1	†	396	††	14.6		115	†	224	†	386	
50025	GJ-23	60.2		33.4		343		209		47.7	†	38.3		41.1		294		15.3	††	110		218		370	
50027	DN-24	56.2		27.7		356		216		55.8		39.4		39.7		334		12.6		113		214		357	
50029	AD-23	55.3		33.4		348		225		56.3		46.4		43.6		322		12.5		102		209		368	
50032	DE-11	73.2	††	31.8		373		233		55		38.7		33.3	††	303									
52283	GJ-23	56.3		32.2		335		232		53.4		45.6		40.6		315		11.4		108		201		336	
52387	DE-11	56.4		25.3		346		211		53.8		38.8		39.3		323		11.6		110		180	††	320	
52491	GI-23	52.3		28.6		292	††	183		50		36.6		39		293		9.35		103		166	††	312	
52494	GG-23	68.5	††	34.5		307	††	185		54.4		38.9		42		281		12.5		99		159	††	286	
52495	GI-24	57.9		32.5		341		198		53.8		39		42.3		326									
52495	GI-36																	12.5		102		170	††	358	
52508	AE-23									46.5	†	31.9		29.4	††	257	††								
52565	DN-23	43.8	††	23.6	†	278	††	188		50.6		33		34.4	†	304		9.5		99.7		187	†	309	

52610	DE-24	56		29		330		200																	
52636	DE-23	55.5		23.4	†	323		202		50.6		33		34.4	†	304		9.31		98.7		186	†	306	
52874	GI-23	51.2		26.7		311	†	186		49.6		34.9		36.6		294									

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Lead (µg/kg)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		ASP 2202-2		ASP 2202-3		ASP 2202-4		ASP 2205-1		ASP 2205-2		ASP 2205-3		ASP 2205-4		ASP 2208-1		ASP 2208-2		ASP 2208-3		ASP 2208-4	
10156	GI-23	75.4				255		174		125	††	47	††			236	††	9		232		119		152	
10173	DN-24	66.7		2.28		196		143		77.1		10.2		0.75		218		1.98		276		115		154	
11079	DE-23					212		241	††							0.141	††					134			
20204	GJ-23	80.9		8		241		200		60.1	††	14.6		4.89		319	††	5.5		257		167	††	161	
21088	DE-23	1010	††	400	††	1000	††	900	††	500	††	200	††	200	††	400	††	50	††	500	††	400	††	400	††
21100	DE-24	0.544	††	0.5		126	††	87.9	††	77.8		0.1		0.1		177		1		282	††	93.5		149	
21178	DE-24	87		7		200		150																	
21229	GI-24	98.7		6.11		246		195		60.2	††	17.4		4.07		135		3.32		245		102		140	
21230	DE-24	77.2		7.8		232		179		78.2		20		4.8		162		41.2	††	264		134		160	
50004	DE-24	68.9		5.6		178		159		80.3		24.4		1.92		161		2.4		242		107		150	
50005	DE-24	85.5		74.3	††	227		240	††	73.7		13.6		6.73		122		4.09		255		109		155	
50011	DE-24	76.6		10.7		201		160		81.4		21.8		9.94		164		5.8		212	††	110		148	
50012	DN-24	51		11		277		211		149	††	24		4		227	††	80	††	332	††	160	††	264	††
50014	DE-24	77.5		0.83		247		187		66		34.1		14.8	††	180		0.563		240		100		130	††
50018	DE-24	80.4		3.91		4.89	††	67.2	††	4.6	††	3.98		3.96		4.92	††	3.4		246		115		154	
50020	GI-23	1000	††	1000	††	2350	††	1000	††																
50024	GJ-24	83		2.6		246		173		111	††	97	††	34	††	219		2		233		93		142	
50027	DN-24	81		5		265		174		83		19		3.3		171		6		249		117		159	
52495	GI-24	89.9		6.18		247		192		87.1		13.2		2.47		172									
52565	DN-24	190	††	135	††	285		264	††	80.9		27.4		28.9	††	150		6.23		246		132		155	
52610	DE-24	71				220		175																	

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Magnesium (%w/w)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-23	0.08		0.132		0.849		0.215		0.389		0.101		0.115		0.202		0.129		1.08		0.28		0.244	
8888	DE-23	0.08		0.126		0.791		0.206		0.37		0.095		0.106		0.191		0.125		1.03		0.277		0.231	
10156	GI-23	0.0825		0.124		0.828		0.218		0.39		0.096		0.111		0.199		0.122		1.03		0.278		0.236	
10173	DN-24	0.074		0.123		0.745		0.197		0.381		0.097		0.11		0.194		0.123		1.04		0.282		0.246	
10181	GF-23	0.086		0.132		0.875		0.223		0.381		0.096		0.11		0.198		0.133		1.11		0.302		0.259	††
11079	DE-23	0.084		0.126		0.843		0.244	††	0.376		0.094		0.106		0.19		0.114		1.02		0.26		0.21	††
20204	GJ-23	0.081		0.123		0.812		0.191		0.393		0.098		0.12	†	0.2		0.125		0.958		0.26		0.227	
21043	GJ-23	0.07		0.12		0.75		0.18																	
21088	DE-23	0.071		0.11		0.67	††	0.18		0.34	††	0.087		0.099		0.18		0.12		1.02		0.28		0.23	
21100	DE-24	0.0809		0.151	††	0.847		0.223		0.403		0.119	††	0.133	††	0.222	†	0.141	††	1.13		0.288		0.243	
21178	DE-23	0.081		0.12		0.78		0.21																	
21190	AD-13									0.364		0.092		0.112		0.196		0.118		0.928		0.277		0.23	
21229	GI-23	0.0855		0.128		0.837		0.219		0.389		0.097		0.111		0.195		0.121		1.04		0.282		0.234	
21230	DE-23	0.0679	††	0.080	††	0.851		0.195		0.299	††	0.060	††	0.0806	††	0.177		0.0527	††	2.11	††	0.214	††	0.167	††
21232	DE-23	0.0783		0.12		0.772		0.214		0.36		0.09		0.102		0.186		0.116		0.978		0.264		0.222	
50004	DE-23	0.079		0.128		0.884		0.207		0.37		0.097		0.108		0.194		0.12		1.06		0.286		0.239	
50005	DE-23	0.0787		0.103	††	0.802		0.191		0.382		0.096		0.109		0.178		0.122		1.07		0.282		0.232	
50008	GJ-23	0.087		0.132		0.837		0.212																	
50011	DE-23	0.085		0.132		0.794		0.208		0.392		0.1		0.11		0.193		0.121		1.06		0.272		0.234	
50012	DN-23	0.0863		0.127		0.825		0.224		0.411		0.098		0.0988	†	0.186		0.13		1.15		0.31	††	0.257	†
50014	DE-23	0.0847		0.129		0.85		0.22		0.392		0.099		0.114		0.205		0.122		1.07		0.287		0.245	
50017	DE-23	0.069	†	0.128		0.745		0.176		0.351		0.094		0.105		0.231	††								
50018	DE-23	0.079		0.127		0.814		0.205		0.372		0.095		0.109		0.183		0.126		1.04		0.272		0.234	
50020	GI-23	0.1	††	0.12		1.01	††	0.285	††																
50024	GJ-23	0.084		0.136		0.831		0.213		0.393		0.102		0.116		0.222	†	0.136	††	1.1		0.294		0.249	
50025	GJ-23	0.077		0.13		134	††	0.194		0.342	††	0.1		0.109		0.184		0.132		1		0.263		0.236	
50027	DN-24	0.0806		0.126		0.791		0.206		0.382		0.097		0.108		0.194		0.122		1.01		0.282		0.24	
50029	AD-23	0.0826		0.133		0.833		0.219		0.387		0.101		0.109		0.193		0.133		1.09		0.286		0.238	
50032	DE-11	0.078		0.117		0.71	††	0.206		0.36		0.1		0.11		0.18									
52283	GJ-23	0.08		0.112		0.803		0.202		0.348		0.102		0.117		0.21		0.124		1.05		0.302		0.232	
52387	DE-11	0.0904		0.134		0.871		0.23		0.508	††	0.135	††	0.148	††	0.267	††	0.135	†	1.23	††	0.294		0.238	
52491	GI-23	0.0788		0.124		0.797		0.205		0.379		0.092		0.104		0.191		0.121		1.11		0.29		0.247	
52494	GG-23	0.078		0.122		0.786		0.204		0.355		0.09		0.101		0.179		0.109	†	0.953		0.254		0.211	†
52495	GI-24	0.087		0.135		0.839		0.221		0.389		0.1		0.115		0.206									
52508	AE-23									0.348		0.090		0.091	††	0.186									
52565	DN-23	0.066	††	0.12		0.66	††	0.2		0.374		0.091		0.101		0.184		0.117		0.926		0.264		0.226	

52610	GG-23	0.077		0.119		0.776		0.203																	
52636	DE-23	0.0853		0.136		0.859		0.232		0.374		0.091		0.101		0.184		0.113		0.895	††	0.254		0.214	†
52874	GI-23	0.0768		0.121		0.782		0.206		0.36		0.089		0.1		0.19									

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Manganese (mg/kg)											
		February 2022 (Round 2)				*May 2022 (Round 5)*				*August 2022 (Round 8)*			
		ASP 2202-1	**ASP 2202-2**	**ASP 2202-3**	**ASP 2202-4**	**ASP 2205-1**	**ASP 2205-2**	**ASP 2205-3**	**ASP 2205-4**	**ASP 2208-1**	**ASP 2208-2**	**ASP 2208-3**	**ASP 2208-4**
22	DE-23	2120 †	54.9	150	70.2	205	14.5	12.9	153	25.5	211	28.6	39.3
8888	DE-23	1920	49.2	143	65.3	202	13.2	11.7	147	25.7	220	29.3	39.3
10156	GI-23	1800	48.5	150	68.9	209	14.3	12.7	155	25.4	219	29.2	39.5
10173	DN-24	1780	50.4	141	65.2	204	14.6	11.5	150	24.6	205	28.6	38.5
11079	DE-23	1750	51.9	149	69.1	181	12.5	11.1	136	22.5 ††	204	27.3	35.2 ††
20204	GJ-23	1730	48.4	139	60.2	163 ††	14	12.6	149	24.2	205	30.4	37.8
21043	GJ-23	1830	51.2	146	61								
21088	DE-23	1580	42 †	120 ††	62	180 †	12	11	140	25	240 ††	30	39
21100	DE-24	2050	65.8 ††	156 †	70.8	200	15.8	13.8	158	26.6	216	27	37
21178	DE-23	1800	46	140	63								
21190	AD-13					198	10.1 ††	11.1	137	24.3	213	30.7 †	35 ††
21229	GI-23	1780	51.4	140	64.7	197	14	12.7	142	25	207	28.5	39.1
21230	DE-23	1660	46.3	124 ††	58.2	173 †	12.3	10.9	129 ††	23.2	182 ††	25.3 ††	35.4 ††
21232	DE-23	1960	48.9	143	69.1	194	13.3	11.8	143	24.5	204	27.9	38.3
50004	DE-23	1820	49	140	65.5	189	14.5	12.2	143	25.7	211	29.1	40.6
50005	DE-23	1770	48.2	140	66.3	191	14.7	12.1	138	25.3	210	28.3	39
50008	GJ-23	2020	56	154	69.5								
50011	DE-23	1800	53.6	141	68.4	201	14.3	12.6	145	25.3	200	28.4	39.4
50012	DN-23	1950	52.7	155 †	72.2	227 ††	14.7	11.9	149	32.1 ††	257 ††	35.1 ††	48.3 ††
50014	DE-23	2000	52.9	155 †	71.9	205	14.1	12.7	155	25.4	219	29.3	40.8
50017	DE-23	1790	20.5 ††	136	63.9	168 ††	15.8	12.6	39.5 ††				
50018	DE-23	1820	51.7	142	64.2	201	13.5	12.1	143	24.7	210	28.2	38.6
50020	GI-23	2160 ††	50.2	176 ††	86.1 ††								
50024	GJ-23	1950	54.8	149	68.6	201	14.2	12.7	163 ††	27.3	225	29.2	41
50025	GJ-13	1610	49.3	134	63	195	15	13	149	28 ††	214	28.3	40
50027	DN-24	1860	47.4	145	64.9	196	13.4	11.9	144	23.3	221	29	38.8
50029	AD-23	2360 ††	54.9	139	68.6	204	15.2	12.8	147	28.8 ††	219	29.1	39.9
50032	DE-11	2030	47.3	142	65.4	147 ††	14.3	11.9	140				
52283	GJ-23	1760	44.7	139	63	147 ††	14.4	13	158	24.4	211	28.8	38.5
52387	DE-11	1870	42.3	133	60.5	192	13.1	11.9	146	25.7	217	28.7	39.5
52491	GI-23	1850	49.8	140	65.8	196	12.8	11.4	142	15.6 ††	150 ††	18.8 ††	25.6 ††
52494	GG-23	1920	49.6	145	66.7	186	12.5	11.1	133	22.9	203	26.7	35.8 †
52495	GI-24	1830	54.5	133	64.3	209	14.3	13.1	157				
52495	GI-36									26.9	207	25.9 ††	40.1
52508	AE-23					177 †	12.3	10.8	119 ††				
52565	DN-23	1440 ††	46.6	122 ††	59.6	206	11.9	10.8	146	23.3	193	27.9	37.3

52610	DE-24	1900		51		140		71																	
52636	DE-23	1700		49.2		129		63.3		206		11.9		10.8		146		22.7		192		27.1		36.6	†
52874	GI-23	1810		48.4		141		66.6		184		12		10.7		141									

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Molybdenum (µg/kg)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-24	246		1070		273		931		169		840		2480		579		176		8930		201		1370	
8888	DE-24	273		1120		294		958		194		880		2440		634		167		8830		185		1340	
10156	GI-23	265		1250		295		1000		167		914		2500		654		171		8940		171		1350	
10173	DN-24	271		1140		323	††	1000		163		871		2430		669		175		9000		257	††	1380	
11079	DE-23	164	††	1060		259		857		212		834		2100		549		174		8130		200		1200	
20204	GJ-23	249		1100		283		743	††	125		798		2240		532		170		9150		173		1150	††
21088	DE-23	240		950		270		890		197		899		2310		600		230	††	8900		260	††	1470	
21100	DE-24	428	††	1190		407	††	1170	††	187		950		2560		657		153		10200		174		1540	††
21178	DE-24	46	††	840	††	58	††	260	††																
21229	GI-24	252		1090		278		927		171		827		2270		574		166		9410		184		1330	
21230	DE-24	213		921		237		799	††	193		869		2430		630		135		7350	††	173		1100	††
50004	DE-24	203		863	††	232	††	872		215		715		2120		564		153		11000	††	233		1430	
50005	DE-24	246		1190		250		757	††	129		890		2310		461		177		9640		194		1370	
50011	DE-24	265		1080		291		935		180		795		2210		574		156		9130		195		1320	
50012	DN-24	140	††	925		286		1050	††	284	††	1320	††	3390	††	815	††	176		10500	††	241		2170	††
50014	DE-24	267		1160		283		933		300	††	920		2440		630		190		8530		190		1260	
50018	DE-24	252		1130		278		879		156		853		2330		581		172		9410		183		1330	
50020	GI-23	1000	††																						
50024	GJ-24	234		1030		276		832		165		779		2200		572		167		8280		221		1240	
50027	DN-24	238		1040		267		889		162		806		2240		543		153		8730		172		1300	
50029	AD-23	229		1140		259		851		132		882		2380		523		140		8730		182		1150	††
52495	GI-24	247		1210		251		888		174		886		2470		599									
52508	AE-23									0.15	††	0.65	††	1.15	††	0.12	††								
52565	DN-24	299		1050		287		922		150		704	††	2000	††	533		154		9070		172		1340	
52610	DE-24	245		1200		270		900																	
52636	DE-23									150		704	††	2000	††	533									
52874	GI-23	1000	††	3290	††	697	††	1340	††	440	††	736		1810	††	393	††								

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Nitrogen (%w/w)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		ASP 2202-2		ASP 2202-3		ASP 2202-4		ASP 2205-1		ASP 2205-2		ASP 2205-3		ASP 2205-4		ASP 2208-1		ASP 2208-2		ASP 2208-3		ASP 2208-4	
22	CA-37	1.03		1.75		4.26		4.04		2.33		1.52		3.83		1.94		1.37		5.5		2.3		1.64	
8888	CA-37	0.995		1.7		4.2		3.89		2.47	†	1.67		3.8		2.06		1.4		5.29		2.34		1.74	††
10156	CA-37									2.31		1.58		3.82		1.99		1.39		5.56		2.36		1.66	
10173	CA-37									2.3		1.57		3.82		1.99		1.34		5.44		2.34		1.65	
10181	CA-37	1.07		1.79		4.31		4.08		2.38		1.61		3.9		2.02		1.47		5.59		2.44		1.71	
10181	GF-31	0.945	††	1.6		4.14		3.97		2.15	††	1.46		3.55		1.77	††	1.26		5.31		2.24		1.53	
11079	CA-37	1.05		1.82		4.26		4.11										1.45		5.46		2.38		1.69	
20204	CA-37	1.03		1.67		4.13		3.96		2.36		1.53		3.77		2.02		1.32		5.47		2.34		1.63	
21043	CA-37	1.04		1.75		4.27		4.06																	
21088	CA-37	1		1.7		4		3.9		2.1	††	1.4		3.4	††	1.7	††	1.2	††	5.2		2.2		1.5	††
21100	CA-37	1.02		1.74		4.32		4.11		2.31		1.54		3.81		2.07		1.34		5.47		2.3		1.62	
21190	GE-38									2.36		1.5		3.5		1.83	†	1.39		5.04	††	2.37		1.65	
21229	GE-31	1.01		1.75		4.14		3.87		2.26		1.55		3.74		1.92		1.3		5.32		2.27		1.59	
21229	CA-37	1.03		1.7		4.06		3.86		2.27		1.53		3.76		1.89		1.34		5.39		2.29		1.61	
21230	CA-37	1.01		1.71		4.2		3.96		2.33		0.54	††	3.8		1.95		1.33		5.4		2.29		1.61	
21232	CA-37	1		1.68		3.93	††	3.82		2.17	†	1.39		3.42	††	1.78	††	1.3		5.28		2.22		1.54	
50004	CA-37	1.04		1.7		4.26		4.1		2.28		1.52		3.7		1.97		1.34		5.42		2.28		1.68	
50005	CA-37	1		1.69		4.23		4.02		2.39		1.53		3.69		1.95		1.32		5.49		2.37		1.62	
50008	CA-27	1.08		1.78		4.28		4.07																	
50011	CA-37	1.05		1.75		4.34		4.14		2.35		1.57		3.89		1.99		1.36		5.56		2.37		1.66	
50012	CA-37	0.952	††	1.6		3.9	††	3.78		2.35		1.59		3.85		2		1.31		5.33		2.29		1.6	
50014	CA-37	1.07		1.78		4.3		4.08		2.38		1.6		3.9		2.05		1.42		5.55		2.37		1.73	
50017	CA-37	1.11	††	1.81		4.32		4.15		2.19	†	1.5		3.59		1.35	††	1.31		3.13	††	2.31		1.64	
50018	CA-37	1.03		1.76		4.36		4.12		2.34		1.59		3.74		1.98		1.35		5.47		2.35		1.63	
50020	CA-37	0.88	††	1.6		4.13		3.87																	
50024	CA-37	1.01		1.75		4.27		4.03		2.37		1.56		3.86		2.05		1.4		5.59		2.45		1.73	
50027	CA-37	1.02		1.67		4.16		4		2.31		1.5		3.63		1.92		1.3		5.36		2.32		1.62	
50027	CA-26									2.3		1.59		3.46		2.04		1.26		5.32		2.28		1.84	††
50029	CA-37	1.01		1.67		4.1		3.95		2.24		1.5		3.6		1.82	†	1.33		5.36		2.32		1.63	
52283	CA-37	1.02		2.11	††	4.19		2.64	††	2.37		1.62		3.86		2.01		1.36		5.42		2.7	††	1.63	
52387	CA-37	0.924	††	1.41	††	3.69	††	3.99		2.47	†	1.63		4.03		2.02		1.24		4.7	††	2.04	††	1.56	
52491	CA-37	1.02		1.7		4.22		4.01		2.25		1.51		3.67				1.25		5.31		2.25		1.67	
52494	CA-37	1		1.66		4.18		3.82		2.32		1.49		3.66		1.86		1.22		5.25		2.19	††	1.57	
52495	CA-37	1.07		1.75		4.29		4.2		2.58	††	1.63		4.04		2		1.48	††	5.84	††	2.56	††	1.81	††
52508	GE-38									1.7	††	1.74	††	3.86		2.26	††								
52565	CA-37	1.02		1.7		4.11		3.9		2.26		1.63		3.45	†	1.86		1.26		5.52		2.3		1.6	

52636	CA-37	0.95	††	1.6		4.1		3.8		2.26		1.63		3.45	†	1.86		1.28		5.51		2.33		1.55	
52874	ZZ-38	1.1	††	1.7		3.76	††	3.56	††	2.34		1.6		3.06	††	1.92									

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Nitrate Nitrogen (mg/kg)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	BA-31	0.001		0.001		993		1060		8.82		3.39		1.24		25.9		0.895		9400		16.1		54.6	
10173	BB-31	9.96		15.7	††	947		1050		41.9	††	26.4	††	7.45		35.8	†	12.4	††	8630		8.47		43.3	†
20204	BB-30	3.85		2.5		1050		1240	†	2	†	2		2		20		1.75		8940		1		52.4	
21088	BB-31	19	††	6		990		1040		16	†	7		41	††	44	††	1.2		8790		24	†	53	
21100	BB-31	7.08		4.13		999		1100		7		2.63		5		26.4		1.42		25.3	††	185	††	313	††
21229	BB-31	7.5		2.25		1100	†	1180		9.9		5.7		1.8		34.5		1.99		9550		6.36		53.3	
21232	BB-31	3.45		2.7		971		1070		11.6		5.95		3.48		24.2		0.0001		9710		8.08		48.6	
50005	BB-31	3.28		1.71		1010		1110		8.47		2.21		3.02		37.8	†	2.03		9100		9.27		55.3	
50011	BB-31	7.88		5.7		987		1080		16.6	†	13.3	†	3.62		44.9	††	1.32		8820		11.5		58.2	
50012	BB-31	1.24		1.3		887	†	994		7.23		0.552		1.47		29.2									
50020	BA-31	50	††	50	††	50	††	50	††																
50025	BB-31	73.8	††	57.5	††	1110	††	1110		27	††	25	††	45	††	25		33	††	10000	†	25	†	81.2	††
50027	BB-31	6		5		980		1030		5		5		4		25		2		8900		7		50	
50029	BB-31	1.6		3.22		973		1070		8.59		6.82		7.3		25.5		3.33	††	8990		20.9	†	54.6	
50032	BB-31	5.48		6.6		183	††	928		3.42		2.51		23.2	††	35.1	†								
52494	BA-31	2.5		0.4		945		1010		8.08		1.7		2.7		27.3		1.29		8190		9.67		46.2	
52565	BA-31	5		5		899	†	994		30.9	††	16.9	††	29.3	††	28.4		1		3850	††	1		1	††

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Phosphorus (%w/w)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-23	0.088		0.412		0.394		0.438		0.136		0.339		0.41		0.324		0.355		0.783		0.158		0.398	
8888	DE-23	0.087		0.391		0.383		0.418		0.136		0.32		0.383		0.309		0.348		0.767		0.16		0.383	
10156	GI-23	0.0854		0.373		0.387		0.428		0.143		0.329		0.395		0.327		0.35		0.818		0.17		0.406	
10173	DN-24	0.085		0.377		0.395		0.414		0.142		0.312		0.381		0.312		0.337		0.791		0.168		0.404	
10181	GF-31	0.088		0.408		0.394		0.432		0.132		0.315		0.381		0.301		0.379		0.805		0.171		0.405	
11079	DE-23	0.0864		0.399		0.38		0.42		0.127		0.298		0.352		0.291		0.321		0.739		0.151		0.354	
20204	GJ-23	0.082		0.373		0.378		0.434		0.154		0.318		0.393		0.334		0.339		0.771		0.188	††	0.372	
21043	GJ-23	0.09		0.39		0.38		0.4																	
21088	DE-23	0.08		0.35		0.33	††	0.38	†	0.12	†	0.3		0.35	†	0.29		0.32		0.7	†	0.15		0.34	
21100	DE-24	0.0841		0.374		0.377		0.412		0.147		0.356	†	0.427	††	0.352		0.359		0.82		0.161		0.373	
21178	DE-23	0.083		0.38		0.38		0.41																	
21190	GE-30									0.138		0.3		0.382		0.306		0.357		0.758		0.16		0.378	
21229	GI-23	0.0869		0.387		0.387		0.426		0.143		0.315		0.372		0.309		0.332		0.81		0.159		0.383	
21230	DE-23	0.0646	††	0.293	††	0.271	††	0.296	††	0.0896	††	0.236	††	0.286	††	0.218	††	0.269	††	0.564	††	0.116	††	0.285	††
21232	DE-23	0.085		0.384		0.374		0.409		0.135		0.312		0.374		0.302		0.336		0.729		0.154		0.373	
50004	DE-23	0.085		0.388		0.391		0.423		0.136		0.321		0.374		0.311		0.339		0.849		0.167		0.404	
50005	DE-23	0.0843		0.036	††	0.372		0.407		0.135		0.315		0.382		0.334		0.34		0.79		0.162		0.384	
50008	GJ-23	0.089		0.405		0.39		0.423																	
50011	DE-23	0.089		0.411		0.366		0.415		0.134		0.335		0.391		0.302		0.347		0.744		0.153		0.387	
50012	DN-23	0.0894		0.394		0.399		0.433		0.176	††	0.375	††	0.395		0.328		0.43	††	0.897	††	0.201	††	0.482	††
50014	DE-23	0.0917		0.417		0.41		0.442		0.141		0.338		0.41		0.323		0.357		0.812		0.165		0.402	
50017	DE-23	0.071	††	0.316	††	0.359		0.351	††	0.155	†	0.319		0.331	††	0.361	†								
50018	DE-23	0.085		0.394		0.378		0.421		0.131		0.33		0.383		0.301		0.342		0.794		0.158		0.386	
50020	GI-23	0.1	††	0.35		0.47	††	0.525	††																
50024	GJ-23	0.092		0.412		0.4		0.428		0.141		0.327		0.391		0.344		0.357		0.81		0.167		0.399	
50025	GJ-23	0.084		0.381		0.382		0.422		0.133		0.335		0.395		0.34		0.36		0.784		0.15		0.401	
50027	DN-24	0.0843		0.367		0.374		0.403		0.132		0.305		0.352		0.303		0.319		0.774		0.159		0.37	
50029	AD-23	0.0856		0.415		0.401		0.464	††	0.141		0.337		0.405		0.316		0.362		0.861		0.162		0.403	
50032	DE-30	0.083		0.361		0.383		0.39		0.14		0.31		0.35	†	0.29									
52283	GJ-23	0.085		0.382		0.387		0.416		0.148		0.275	†	0.381		0.357		0.343		0.8		0.169		0.389	
52387	DE-30	0.0783		0.339	†	0.335	††	0.357	††	0.125		0.302		0.368		0.296		0.333		0.559	††	0.153		0.368	
52491	GI-23	0.0877		0.392		0.39		0.43		0.115	††	0.263	††	0.314	††	0.253	††	0.344		0.837		0.172		0.428	
52494	GG-23	0.088		0.385		0.393		0.422		0.132		0.301		0.366		0.303		0.31		0.737		0.152		0.363	
52495	GI-24	0.0902		0.403		0.371		0.404		0.144		0.315		0.391		0.319									
52495	GI-36																	0.257	††	0.384	††	0.0746	††	0.25	††
52508	AE-30									0.125		0.298		0.354		0.298									

52565	DN-23	0.13	††	0.37		0.34	††	0.4		0.144		0.321		0.387		0.335		0.312		0.737		0.155		0.37	
52610	GG-23	0.081		0.369		0.344	††	0.389																	
52636	DE-23	0.108	††	0.522	††	0.501	††	0.579	††	0.144		0.321		0.387		0.335		0.317		0.836		0.179		0.387	
52874	GI-23	0.078		0.341	†	0.348	†	0.38	†	0.12	†	0.272	††	0.323	††	0.28									

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Potassium (%w/w)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-23	0.98		0.399		6.46		3.67		0.952		0.451		1.14		2.25		0.299		5.4		1.78		1.96	
8888	DE-23	0.911		0.372		5.83		3.37		0.898		0.423		1.05		2.11		0.31		5.62		1.78		1.9	
10156	GI-23	0.902		0.365		7.04	††	4.21	††	0.925		0.43		1.08		2.15		0.294		5.62		1.75		1.9	
10173	DN-24	0.879		0.367		5.72		3.32		0.969		0.443		1.13		2.18		0.297		5.05		1.71		1.91	
10181	GF-23	0.985		0.406		7.45	††	3.64		0.929		0.434		1.09		2.14		0.329	††	5.78		1.89	†	2.03	
11079	DE-23	0.907		0.425	††	6.06		3.2		0.907		0.407		1.01		2.07		0.29		5.28		1.64	†	1.76	
20204	GJ-23	0.94		0.382		5.84		3.78		0.978		0.35	†	1.06		2.2		0.27		5.4		1.73		1.84	
21043	GJ-23	0.9		0.37		5.9		3.19																	
21088	DE-23	0.87		0.35		5	†	3.1		0.9		0.41		1.02		2.1		0.29		3.5	††	1.4	††	1.5	††
21100	DE-24	0.937		0.442	††	6.26		3.68		0.918		0.493	††	1.28	††	2.41	†	0.32	†	5.67		1.77		1.97	
21178	DE-23	0.84		0.35		5.9		3.18																	
21190	GE-09									0.957		0.328	††	0.887		1.95		0.349	††	4.9		1.77		1.84	
21229	GI-23	0.951		0.369		5.97		3.42		0.913		0.419		1.07		2.08		0.28		5.1		1.71		1.82	
21230	DE-23	0.684	††	0.164	††	4.84	††	2.83		0.67	††	0.197	††	0.666	††	1.77	†	0.131	††	4.42		1.54	††	1.58	†
21232	DE-23	0.902		0.362		5.59		3.14		0.891		0.401		0.945		1.9		0.274		4.83		1.55	††	1.7	
50004	DE-23	0.868		0.362		6.41		4.08	††	0.909		0.402		1.02		2.14		0.288		5.56		1.79		1.92	
50005	DE-23	0.935		0.382		6.03		3.47		0.915		0.425		1.03		2.09		0.277		5.31		1.69		1.86	
50008	GJ-23	0.939		0.398		6.2		3.55																	
50011	DE-23	0.967		0.395		5.84		3.45		0.94		0.432		1.07		2.11		0.29		5.02		1.68		1.89	
50012	DN-23	0.872		0.322	†	5.27		3.16		0.843		0.412		0.857	†	1.61	††	0.283		4.88		1.67		1.84	
50014	DE-23	0.945		0.382		6.14		3.52		0.944		0.429		1.1		2.22		0.294		5.36		1.8		1.95	
50017	DE-23	0.799	†	0.252	††	4.69	††	2.75	†	0.851		0.397		0.996		1.69	††								
50018	DE-23	0.931		0.372		5.77		3.32		0.911		0.392		1.02		2.05		0.283		5.25		1.76		1.85	
50020	GI-23	1.05	††	0.32	†	6.8	††	4.15	††																
50024	GJ-23	0.959		0.388		6.14		3.38		0.931		0.414		1.05		2.32		0.292		5.49		1.77		1.87	
50025	GJ-23	0.932		0.398		3.85	††	3.03		0.802	†	0.408		0.936		1.81	†	0.335	††	3.61	††	0.173	††	1.71	
50027	DN-24	0.905		0.373		5.79		3.39		0.933		0.427		1.05		2.17		0.297		5.24		1.77		1.95	
50029	AD-23	0.876		0.369		5.8		3.44		0.82	†	0.379		0.902		1.96		0.245	††	5.12		1.69		1.8	
50032	DE-11	0.927		0.383		4.56	††	3.39		0.95		0.42		1.02		2.04									
52283	GJ-23	0.935		0.363		5.83		3.32		0.981		0.371		1.02		2.46	†	0.282		5.23		1.79		1.87	
52387	DE-09	0.996		0.392		6.49		3.76		0.948		0.42		1.05		2.16		0.306		5.71		1.85		2.15	††
52491	GI-23	0.866		0.355		5.62		3.26		0.797	†	0.351	†	0.877	†	1.79	†	0.285		5.23		1.76		1.93	
52494	GG-23	0.907		0.364		6.04		3.35		0.851		0.392		0.988		1.98		0.267		4.93		1.63	†	1.74	
52495	GI-24	0.99		0.409		6.1		3.63		1.01	†	0.466	†	1.13		2.14									
52495	GI-36																	0.288		4.55		1.74		1.75	
52508	AE-23									0.789	††	0.359	†	0.978		1.84	†								

52565	DN-23	0.68	††	0.33		4.49	††	2.87		0.746	††	0.344	††	0.824	††	1.66	††	0.244	††	4.39		1.47	††	1.52	††
52610	GG-23	0.878		0.358		5.69		3.39																	
52636	DE-23	0.871		0.354		5.56		3.4		0.746	††	0.344	††	0.824	††	1.66	††	0.223	††	4.19	†	1.46	††	1.52	††
52874	GI-23	0.84		0.338		5.61		3.3		0.827		0.37		0.95		2									

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Selenium (µg/kg)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-24	32.2		129		21.8		65.7		78.9		1100		1010		30.1		15.2		17.8		68		74.7	
8888	DE-24	60.8		156		30.4		88.9		96.9		1030		1000		40.9		10		10		78		71.6	
10156	GI-23											1290	††	1380	††			204	††			194	††	183	††
10173	DN-24	0.01		142		0.01		54.3		70.5		952		920		14.7		12.8		0.01		60.7		61	
20204	GJ-23	43.1		164		52		24.8		100		911		908		1000	††	17		28		50		80	
21088	DE-23	3030	††	1900	††	1200	††	1700	††	1170	††	1290	††	1080		890	††	530	††	1000	††	560	††	1500	††
21100	DE-24	201	††	260	††	219	††	272	††	161		1090		1010		204	††	50.9	††	85.8	††	194	††	141	††
21178	DE-24	27		110		28		46																	
21229	GI-24	58.3		146		87.1	††	139		178		967		1100		121	††	23.3		64.3	††	85		86	
21230	DE-24	50.9		119		64	††	101		107		836		819		61.5		16.8		32.7		70		80.3	
50004	DE-24	37.8		175		20.4		89.2		125		966		925		48		10.1		8.4		89.2		93.4	
50005	DE-24	49.8		93		39.9		64.7		125		959		921		52.4		18.8		30.7		88.4		80.3	
50011	DE-24	19.5		171		21		88		109		1010		979		36.4		15.8		24.7		109		84.5	
50012	DN-24	29		135		28		94		130		1360	††	1350	††	61		17		19		95		104	
50014	DE-24	29.6		153		10.7		67		80		980		933		26		23.5		14.8		70		80	
50018	DE-24	35.3		21.3	††	35.2		18.1		35.2		26.3	††	927		33.4		16.8		42.8		83.4		79.6	
50020	GI-23	1000	††																						
50024	GJ-24	89	††	120		92	††	113		121		908		913		55		20		57		103		90	
50027	DN-24	30		123		17		64		83		849		808		45		14		12		67		64	
52495	GI-24	39.7		176		28.1		88.4		90.5		1060		1080		51.8									
52565	DN-24	271	††	292	††	274	††	250	††									5	††	12.8		39.7		32.7	††
52610	DE-24	38.5		195		24		100																	

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Silicon (%w/w) – Not Certified																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
20204	GJ-23	0.1		0.016		0.04		0.02		0.036		0.007		0.0011		0.011		0.002		0.0023	††	0.0028	††	0.0238	
21088	DE-24	0.08		0.024		0.053		0.06		0.069		0.009		0.0008	†	0.088		0.005		0.031		0.063		0.008	
21100	DE-24	0.0815		0.052	††	0.032		0.079		0.0614		0.061	††	0.0531	††	0.0899		0.084	††	0.0955	††	0.0833		0.111	
21229	ZZ-23	0.208		0.072	††	0.114	††	0.715	††	0.248	††	0.098	††	0.0722	††	0.382	††	0.082	††	0.0663	††	0.0734		0.387	††
50004	DE-23	0.058		0.014		0.045		0.038		0.07		0.012		0.001		0.091		0.011		0.029		0.059		0.07	
50005	DE-23	0.994	†	0.015		0.039		0.081		0.0569		0.008		0.00102		0.143		0.00997		0.0245		0.0615		0.101	
50008	ZZ-23	0.187		0.021		0.289	††	0.665	††																
50012	DN-23									390	††	70	††	2.4	††	580	††	0.008		0.035		0.049		0.061	
50018	DB-31	0.0764		0.018		0.045		0.071		0.036		0.004		0.00115		0.0576		0.012		0.024		0.061		0.078	
50020	GI-23	0.003		0.003		0.007	†	0.006																	
50024	ZZ-23	0.207		0.028		0.301	††	0.742	††	0.264	††	0.019	†	0.0025	††	0.899	††	0.016		0.064	††	0.163	††	1.45	††
52565	DN-23	0.04		0.01		0.02		0.02		0.0313		0.008		0.0011		0.029		0.009		0.018		0.03		0.008	
52636	DE-23	0.048		0.015		0.033		0.039		0.0313		0.008		0.0011		0.029		0.009		0.024		0.043		0.019	

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Sodium (mg/kg)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-23	183		25.4		92.1		3470		41.2		309		14.9		2860		11.7		227		89		2150	
8888	DE-23	170		16.8	†	82.8		3360		40.6		289		25.8	††	2710		19.8		216		86.7		2100	
10156	GI-23	192		25.6		91.3		3570	†	43.2		326		17.9		3010		14.2		249		94		2300	
10173	DN-24	170		23		81.3		3080		41.8		269		15.8		2800		14.4		244		93.9		2300	
11079	DE-23	184		27.3		99.5		3810	††	43.9		291		17.2		2770		16.3		238		90.7		2000	
20204	GJ-23	190		20		95		2340	††	44		283		17.5		2190		20		270	†	100		1950	
21043	GJ-23	408	††	63.8	††	123	†	3200																	
21088	DE-23	270	††	28		98		3320		59	††	295		17		2700		50	††	420	††	150	††	2820	††
21100	DE-24	179		29.3		80		3570	†	44		349	††	20		3030		16.3		250		91.3		2200	
21178	DE-23	200		29		105		3400																	
21229	GI-23	191		27.3		92.1		3140		36.3		306		26.6	††	2660		11.5		222		81.1		2120	
21230	DE-23	148	††	13.8	††	101		3220		31.1	††	159	††	11.9	†	2530		7.19		280	†	86.6		1950	
21232	DE-23	180		20		93.3		3180		40		270		20		2470		0.001	†	0.024	††	0.009	††	0.188	††
50004	DE-23	172		24.8		90.7		3260		41		280		17		2670		15.4		251		95.9		2090	
50005	DE-23	179		29.8		90.3		3540		44.3		268		18		2710		15.4		244		108	†	2120	
50008	GJ-23	206		45.9	††	109		3310																	
50011	DE-23	191		26.4		82.9		3290		40.8		298		16.7		2680		18		228		91		2120	
50012	DN-23	240	††	33		230	††	4210	††	105	††	281		43	††	2690		21		479	††	176	††	2170	
50014	DE-23	180		15	†	80		3390		42		300		16		2830		2		230		80		2200	
50017	DE-23	198		14.2	††	114		3330		43.6		253		18.1		2000	††								
50018	DE-23	187		28.4		98.6		3140		64.2	††	210	††	17.6		2270		14.1		242		97.2		2110	
50020	GI-23	210		25		109		4080	††																
50024	GJ-23	191		27.2		89.6		3370		44.7		312		16.1		3090		10.1		244		91.6		2190	
50025	GJ-23	0.02	††	0.009	††	0.013	††	0.318	††	64	††	268		94	††	2080	††	92	††	245		152	††	1700	††
50027	DN-24	181		25.1		86		3230		41.5		294		19.2		2740		18		235		93		2230	
50029	AD-23	187		35.4	†	118		3270		108	††	268		25.6	††	2570		20.6		246		106		2050	
50032	DE-11	163		28		68		2720	††	43.5		285		48	††	2510									
52283	GJ-23	188		28.4		98.4		3660	††	70	††	332		28.5	††	2920		10.7		240		102		2120	
52387	DE-09	142	††	20.2		46.5	††	2340	††	56.9	††	208	††	62.5	††	2480		26.6		193	††	86.9		1520	††
52491	GI-23	174		25.7		82		3140		56.6	††	263		19.6		2270		7.49		224		80.7		2140	
52494	GG-23	291	††	36.5	†	128	††	3300		67.3	††	288		29.3	††	2570		10.5		242		114	†	1950	
52495	GI-24	181		23.9		78.1		3190		39.1		304		13.9		2930									
52508	AE-23									143	††	291		49	††	2540									
52565	DN-23	115	††	4.48	††	49.9	††	3240		31.7	††	245		14		2200		17.1		215		83.8		1720	††
52610	GG-23	176		22.5		84.5		3360																	
52636	DE-23	154	†	85	††	53	††	3250		31.7	††	254		12.8	†	2640		10.2		220		80.3		1710	††

52874	GI-23	174		16	†	108		3190		38.6		255		16.5		2280									

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Sulphur (%w/w)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-23	0.201		0.148		0.463		0.377		0.238		0.113		0.145		0.243		0.097		0.659		0.212		0.172	
8888	DE-23	0.213		0.155		0.488		0.392		0.246		0.111		0.141		0.243		0.096		0.664		0.22		0.171	
10156	GI-23					0.632	††	0.486	††																
10173	DN-24	0.192		0.126		0.449		0.358		0.231		0.104		0.132		0.224		0.086		0.627		0.218		0.168	
11079	DE-23	0.19		0.14		0.436		0.351		0.206		0.095		0.119		0.206		0.127	††	0.657		0.226		0.178	
20204	GJ-23	0.194		0.139		0.423		0.46	††	0.247		0.11		0.143		0.247		0.0923		0.654		0.21		0.166	
21043	GJ-23	0.19		0.14		0.38		0.32																	
21088	DE-23	0.17	†	0.11		0.36	†	0.3		0.2	†	0.09	†	0.12		0.2		0.09		0.62		0.2		0.16	
21100	CA-37	0.199		0.174	†	0.43		0.423	†	0.233		0.138	††	0.164	††	0.259		0.119	††	0.588	†	0.203		0.19	††
21178	DE-23	0.15	††	0.11		0.37	†	0.27	†																
21229	GI-23	0.194		0.139		0.44		0.359		0.234		0.104		0.131		0.225		0.0926		0.661		0.217		0.168	
21230	DE-23	0.155	††	0.112		0.344	††	0.279	†	0.173	††	0.078	††	0.1	††	0.172		0.0758	††	0.504	††	0.166	††	0.133	††
21232	DE-23	0.184		0.13		0.412		0.35		0.217		0.097		0.124		0.21		0.0867		0.593	†	0.196		0.156	†
50004	DE-23	0.188		0.137		0.439		0.356		0.229		0.103		0.129		0.227		0.093		0.683		0.219		0.169	
50005	DE-23	0.177		0.127		0.435		0.326		0.23		0.102		0.129		0.224		0.0912		0.668		0.209		0.166	
50008	GJ-23	0.213		0.151		0.473		0.389																	
50011	DE-23	0.196		0.143		0.418		0.348		0.228		0.107		0.132		0.22		0.094		0.619		0.203		0.165	
50012	DN-23	0.192		0.137		0.445		0.359		0.266	††	0.112		0.13		0.229		0.0969		0.705		0.226		0.178	
50014	DE-23	0.206		0.151		0.466		0.376		0.238		0.108		0.139		0.237		0.096		0.656		0.213		0.17	
50017	DE-23	0.157	††	0.124		0.4		0.284		0.226		0.105		0.134		0.183									
50017	CA-37									0.181	††	0.106		0.128		0.211		0.11	††	0.173	††	0.155	††	0.175	
50018	DE-23	0.193		0.141		0.438		0.352		0.225		0.101		0.132		0.219		0.093		0.663		0.213		0.17	
50020	GI-23	0.23	††	0.13		0.535	††	0.445	††																
50024	GJ-23	0.206		0.128		0.441		0.342		0.255		0.102		0.126		0.263		0.084		0.65		0.207		0.165	
50025	GJ-23	0.196		0.13		0.427		0.331		0.208		0.093		0.113		0.201		0.091		0.657		0.216		0.166	
50027	DN-24	0.178		0.125		0.437		0.345		0.231		0.104		0.124		0.22		0.0882		0.67		0.216		0.164	
50029	CA-37	0.2		0.151		0.374	†	0.367		0.22		0.108		0.129		0.208		0.105	†	0.658		0.207		0.186	††
50032	DE-30	0.227	††	0.151		0.375	†	0.322		0.24		0.11		0.13		0.23									
52283	GJ-23	0.192		0.182	††	0.439		0.34		0.244		0.129	††	0.135		0.272		0.091		0.675		0.205		0.168	
52491	GI-23	0.211		0.154		0.486		0.403		0.247		0.1		0.127		0.232		0.094		0.703		0.227		0.179	†
52494	GG-23	0.189		0.134		0.438		0.348		0.225		0.099		0.127		0.219		0.085		0.619		0.198		0.155	†
52495	GI-24	0.197		0.149		0.415		0.337		0.237		0.107		0.14		0.241									
52495	GI-36																	0.0825		0.372	††	0.14	††	0.121	††
52508	GJ-30									0.294	††	0.179	††	0.154	††	0.35	††								
52565	CA-37	0.16	††	0.13		0.4		0.32		0.209		0.086	†	0.112	†	0.207		0.091		0.684		0.232		0.175	
52610	GG-23	0.173	†	0.124		0.384		0.316																	

52636	DE-23	0.213		0.145		0.44		0.368		0.209		0.086	†	0.112	†	0.207		0.091		0.694		0.235		0.177	
52874	GI-23	157	††	0.112		0.365	†	0.292		0.189	††	0.084	††	0.105	††	0.189									

Lab. Code #	Method Codes	Plant sample identification and values for 2022: Total Zinc (mg/kg)																							
		February 2022 (Round 2)								*May 2022 (Round 5)*								*August 2022 (Round 8)*							
		ASP 2202-1		**ASP 2202-2**		**ASP 2202-3**		**ASP 2202-4**		**ASP 2205-1**		**ASP 2205-2**		**ASP 2205-3**		**ASP 2205-4**		**ASP 2208-1**		**ASP 2208-2**		**ASP 2208-3**		**ASP 2208-4**	
22	DE-23	14.7		19.2		103		35.9		28.7		14.8		23.2		22.9		23.3		29.3		23		25.6	†
8888	DE-23	13.9		17.7		95.3		32.2		27.9		13.7		21.5		22.2		17.6		25.5		19.3		20.3	††
10156	GI-23	23.3	††	17.6		97.8		33.7		28.4		13.3		20.1		21.7		20.5		28.8		23.7		23.2	
10173	DN-24	12.6		15.2		93.4		31.5		28		15		24	††	22.4		21.3		26.1		19.7		22.2	
11079	DE-23	15		19.1		101		36.4		27		12.7		20		21		21.2		27.7		22.3		22.6	
20204	GJ-23	13.7		18.7		92.4		34.4		31.8	†	13.5		21.4		19.8		21.8		27.8		23.7		24	
21043	GJ-23	11.8		16.8		84.9		28																	
21088	DE-23	13		15		74	††	25	††	27		15		23		24		21		27		24		24	
21100	DE-24	13.4		16.1		86.3		30.4		29.8		14.7		23.4		23.2		22.5		29.9		23.5		24.6	
21178	DE-23	13		17		91		32																	
21190	AD-13									26.5		9.96	††	18.7		15.6	††	19.6		32.1		24.3		23.1	
21229	GI-23	14		17.9		94.3		31.5		26.2		13.3		20.8		19.7		21.3		28.3		22.1		23.7	
21230	DE-23	11.3		14.4		77.1	††	25.8	††	22	††	11	†	17.4	††	17.3		18.4		24.1	††	18.7		20.3	††
21232	DE-23	13.9		17		95.5		35.9		27.9		12.9		20.7		20.9		19.1		28.8		20.4		22.1	
50004	DE-23	13.2		18		90.9		32.2		26.7		14.3		21.4		20.9		21.2		27.8		21.5		24.6	
50005	DE-23	14.5		19		92.4		29.1		27.3		13.3		20.8		21.5		20.6		30.2		23.7		23.4	
50008	GJ-23	13.8		18.2		97.2		32.8																	
50011	DE-23	13.8		17.4		89.3		31		27.8		13.9		21.3		20.9		20.3		27.1		20.9		22.9	
50012	DN-23	14.7		18.2		103		35.1		32.1	†	14.2		20.2		20.8		22.4		31.3		23.8		25.6	†
50014	DE-23	14.5		17.9		103		34.3		28.1		13.4		21.6		21.7		20.8		29.4		22.2		23.9	
50017	DE-23	12.4		19.3		93.8		29.1		29.8		14.2		21.7		24.1									
50018	DE-23	13.6		18.9		102		33.7		27.1		13.8		21.3		20.3		21.3		28.9		22.4		23.7	
50020	GI-23	16.5		16.8		114	††	40.7	††																
50024	GJ-23	16		18.9		97.7		33.7		33.5	††	17	††	23.6	†	26	††	22.8		68.3	††	22		23	
50025	GJ-23	13.1		19		82.6		30.7		24.1	†	15.1		20.6		19		28	††	29.1		23.6		26.9	††
50027	DN-24	13.4		16.4		95.1		31.7		27.6		13.4		20.5		21.4		19.6		30.2		22.4		23.5	
50029	AD-23	14.4		20.3		102		36.1		28.6		14.9		22.9		21.5		22.9		31.4		23.6		24.1	
50032	DE-11	15.3		17.5		96.7		31.8		29.4		13.4		19		20.5									
52283	GJ-23	13.6		20.7		95.8		34		29.6		17.9	††	20.5		22.8		21.3		28.6		22.3		23.5	
52387	DE-09	12.7		14.6		84.2		27.7	†	24.2	†	11.4		18.1		18.8		22.1		30.8		17.4	††	18.7	††
52491	GI-23	16.1		19.3		94.3		32.7		26.2		12		18.7		19.1		19.3		30.3		22.6		22.7	
52494	GG-23	14.2		17.9		99.7		33		26.2		12.7		19.9		19.9		19.8		29		20.9		22.2	
52495	GI-24	15.1		19.3		102		34.6		28.4		13.7		22.1		22.5									
52495	GI-36																	24.5		32.7		21.5		26	†
52508	AE-23									25.3		15.9	†	21.8		20.2									
52565	DN-23					84.1				22.4	††	10.2	††	16.4	††	17		20.1		27.9		22.1		22.5	

52610	DE-24	14		17		99		33																	
52636	DE-23	15		18.4		99.5		34.9		22.4	††	10.2	††	16.4	††	17		19.8		27.7		21.6		22.2	
52874	GI-23	13.1		19.4		93.9		32.6		28.3		12.6		20.5		21.1									