# Agriculture Laboratory Proficiency (ALP) Program
## Individual Performance Analysis Report

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*in cooperation with Robert O. Miller, PhD, Program Technical Director*

The Agriculture Laboratory Proficiency (ALP) Program Summer 2010 Round cycle 13 was completed November 12, 2010, with results provided by fifty-nine labs from the United States, Canada, Greece and South Africa. Proficiency samples consisted of five soils, three botanical and three water samples. Analytical methods evaluated are base on those published by AOAC, four regional soil work groups, the Soil Plant Analysis Council and Forestry Canada.

Standard Reference Soils (SRS), materials used for the soils and environmental programs were: SRS-1011 a Chenoa silty clay loam from Livingston Cty, IL; SRS-1012 a Tioga Fine sandy loam collected from Grant Cty, WV; SRS-1013 a Surrency loamy fine sand collected from Duval Cty, FL; SRS-1014 a Tachi clay collected in Fresno Cty, CA; and SRS-1015 a Clarion loam collected in Hancock Cty, IA. Standard Reference Botanical (SRB) materials were: corn stalk from Connecticut, potato Leaves from California and citrus leaves from California. Standard Reference Water (SRW) solutions represent agriculture water samples collected from: Windsor CO; San Joaquin, CA; and Weld Cty, CO.

This Individual Performance Analysis report presents results that are particular to your laboratory. All properties and samples for which your laboratory reported results are presented in this report. An analysis between and within laboratory performance for soild, botanicals, water and environmental properties will follow this page. A summary of results follows immediately after the analysis for each sample type. This summary condenses your between laboratory performance on a single page; this summary may be a the best place to start the review of your results. In the future, this report will also present historical results to provide a more complete understanding of laboratory performance.

It is important to remember that all ALP Program evaluations are based on comparative and consensus statistics; users must be aware that small group statistics are inherently less robust than large group statistics, even though robust evaluations have been preferentially chosen. No comparative results are provided for analyses with fewer than 4 reported results. Results of all laboratories that reported for each property may be found in the web-based

### *Quick Key to your Performance Analysis Report*

| | |
|---|---|
| **Lab Mean** | The mean of the triplicate determinations submitted for each sample-property. |
| **Grand Median** | The median of all included Lab Means submitted for each sample-property. |
| **MAD** | The median of the differences (absolute values) between the Grand Median and the Lab Means. |
| **95% Conf Interval** | The estimated range of value which is likely to include the sample-property value, calculated from the Grand Median and the M.A.D. |
| **WithinLab Performance, k** | The ratio (standard or z-score) of each laboratory standard deviation within each sample-property and the WithinLab Avg STD (see below). A score of 1 indicates that variation within a laboratory for that sample-property was the same as the average variation. |
| **WithinLab Avg STD** | The average (sum of squares) of the standard deviations of the triplicate determinations submitted for each sample-property. |
| **Laboratory-Sample Bias** (from summary page) | The ratio (standard or z-score) of each laboratory difference, between the Lab Mean and the Grand Median, and the M.A.D. A score of 0 indicates agreement of the laboratory with the consensus average. |

## Analysis # 801: Soil Properties

| Test Code | Analysis | Units | Samples | Lab Mean | Grand Median | MAD | 95% Conf Interval | WithinLab Performance, k | WithinLab Avg STD | Labs Rpt |
|---|---|---|---|---|---|---|---|---|---|---|
| 101 | Saturated Paste Moisture | | SRS1011 | 37.2 | 39.8 | 2.95 | 31.3 - 48.4 | 1.91 | 1.9 | 19 |
| | | Percent | SRS1012 | 29.8 | 31.0 | 1.31 | 27.2 - 34.8 | 2.10 | 0.6 | 19 |
| | | | SRS1013 | 28.5 | 30.0 | 1.47 | 25.7 - 34.3 | 1.04 | 0.9 | 19 |
| | | | SRS1014 | 51.2 | 50.3 | 2.83 | 42.1 - 58.6 | 2.31 X | 1.6 | 19 |
| | | | SRS1015 | 27.2 | 31.6 | 2.93 | 23.1 - 40.1 | 1.65 | 1.0 | 19 |
| 102 | pH - sp | | SRS1011 | 6.42 | 6.71 | 0.10 | 6.42 - 7.00 | 0.29 | 0.09 | 17 |
| | | Unit | SRS1012 | 6.74 X | 7.13 | 0.11 | 6.82 - 7.44 | 0.69 | 0.07 | 17 |
| | | | SRS1013 | 5.14 X | 5.48 | 0.09 | 5.23 - 5.73 | 0.94 | 0.10 | 17 |
| | | | SRS1014 | 7.56 | 7.73 | 0.09 | 7.46 - 8.00 | 1.02 | 0.09 | 17 |
| | | | SRS1015 | 6.24 X | 6.51 | 0.08 | 6.28 - 6.75 | 0.81 | 0.11 | 17 |
| 103 | ECe - sp | | SRS1011 | 1.01 | 0.97 | 0.09 | 0.71 - 1.23 | 0.45 | 0.08 | 19 |
| | | dS/m | SRS1012 | 0.56 | 0.51 | 0.044 | 0.39 - 0.64 | 0.47 | 0.03 | 19 |
| | | | SRS1013 | 0.35 | 0.33 | 0.022 | 0.26 - 0.39 | 0.97 | 0.02 | 19 |
| | | | SRS1014 | 3.74 | 3.78 | 0.44 | 2.50 - 5.05 | 0.72 | 0.15 | 19 |
| | | | SRS1015 | 1.42 | 1.39 | 0.15 | 0.96 - 1.81 | 0.18 | 0.06 | 19 |
| 126 | NO3-N Cd. Rd. | | SRS1011 | 37.3 | 42.2 | 2.92 | 33.7 - 50.7 | 0.59 | 1.6 | 32 |
| | | mg/kg | SRS1012 | 14.1 | 13.5 | 1.57 | 8.9 - 18.1 | 0.55 | 0.8 | 32 |
| | | | SRS1013 | 6.23 | 6.18 | 0.71 | 4.11 - 8.24 | 0.43 | 0.75 | 32 |
| | | | SRS1014 | 49.5 | 51.8 | 2.72 | 44.0 - 59.7 | 0.53 | 1.7 | 32 |
| | | | SRS1015 | 41.4 | 43.4 | 2.44 | 36.3 - 50.5 | 0.75 | 1.5 | 32 |
| 134 | PO4-P Olsen/Bicarb (1:20) | | SRS1011 | 12.3 | 14.4 | 1.30 | 10.6 - 18.2 | 0.29 | 1.8 | 27 |
| | | mg/kg | SRS1012 | 13.8 | 12.7 | 2.29 | 6.0 - 19.3 | 0.44 | 1.3 | 27 |
| | | | SRS1013 | 2.80 | 3.05 | 1.00 | 0.15 - 5.95 | 0.81 | 0.77 | 26 |
| | | | SRS1014 | 7.43 | 8.33 | 1.09 | 5.16 - 11.50 | 0.71 | 0.91 | 27 |
| | | | SRS1015 | 20.9 | 21.5 | 2.75 | 13.5 - 29.5 | 0.64 | 1.7 | 26 |
| 145 | K- Bicarb. | | SRS1011 | 132.0 | 124.2 | 9.00 | 98.1 - 150.3 | 1.17 | 1.7 | 4 |
| | | mg/kg | SRS1012 | 146.3 | 106.5 | 14.4 | 64.7 - 148.3 | 1.68 | 3.3 | 4 |
| | | | SRS1013 | 41.0 X | 31.7 | 1.86 | 26.3 - 37.1 | 1.53 | 1.3 | 4 |
| | | | SRS1014 | 369.0 | 336.5 | 36.6 | 230.3 - 442.7 | 1.51 | 5.8 | 4 |
| | | | SRS1015 | 180.0 | 165.8 | 12.2 | 130.4 - 201.2 | 0.82 | 4.4 | 4 |
| 169 | Zn - DTPA | | SRS1011 | 1.08 | 1.05 | 0.13 | 0.68 - 1.41 | 0.24 | 0.09 | 29 |
| | | mg/kg | SRS1012 | 1.00 | 0.82 | 0.11 | 0.50 - 1.14 | 0.20 | 0.05 | 29 |
| | | | SRS1013 | 0.34 | 0.31 | 0.05 | 0.15 - 0.46 | 0.34 | 0.04 | 29 |
| | | | SRS1014 | 0.42 | 0.42 | 0.06 | 0.23 - 0.61 | 0.21 | 0.05 | 29 |
| | | | SRS1015 | 0.43 | 0.40 | 0.07 | 0.21 - 0.59 | 0.36 | 0.04 | 29 |
| 170 | Mn - DTPA | | SRS1011 | 4.04 | 3.09 | 0.96 | 0.29 - 5.88 | 0.02 | 0.74 | 27 |
| | | mg/kg | SRS1012 | 18.7 | 13.2 | 2.13 | 7.0 - 19.4 | 0.65 | 1.3 | 27 |
| | | | SRS1013 | 3.25 | 2.86 | 0.21 | 2.25 - 3.47 | 0.03 | 0.18 | 27 |
| | | | SRS1014 | 8.02 | 7.10 | 0.92 | 4.44 - 9.76 | 0.05 | 3.46 | 27 |
| | | | SRS1015 | 5.98 | 6.00 | 2.33 | 0.00 - 12.77 | 0.11 | 0.79 | 27 |
| 171 | Fe - DTPA | | SRS1011 | 36.9 | 36.1 | 4.14 | 24.1 - 48.1 | 0.13 | 5.0 | 27 |
| | | mg/kg | SRS1012 | 27.2 | 21.7 | 4.60 | 8.4 - 35.1 | 0.26 | 3.2 | 27 |
| | | | SRS1013 | 37.7 | 32.8 | 6.30 | 14.5 - 51.0 | 0.22 | 4.5 | 27 |
| | | | SRS1014 | 2.53 | 3.43 | 0.93 | 0.73 - 6.14 | 1.68 | 0.40 | 27 |
| | | | SRS1015 | 32.6 | 30.4 | 3.80 | 19.4 - 41.5 | 0.53 | 2.0 | 27 |
| 172 | Cu - DTPA | | SRS1011 | 1.08 | 0.97 | 0.17 | 0.48 - 1.46 | 0.16 | 0.07 | 27 |
| | | mg/kg | SRS1012 | 0.82 | 0.67 | 0.11 | 0.35 - 0.99 | 0.00 | 0.05 | 27 |
| | | | SRS1013 | 0.17 | 0.11 | 0.043 | 0.00 - 0.23 | 0.78 | 0.03 | 26 |
| | | | SRS1014 | 2.09 | 2.05 | 0.27 | 1.26 - 2.85 | 0.12 | 0.12 | 27 |
| | | | SRS1015 | 0.47 | 0.42 | 0.11 | 0.11 - 0.74 | 0.24 | 0.04 | 27 |

## Laboratory Performance Summary - Soil Properties

| Test Code | Analysis | Performance Review of Laboratory-Sample Biases (numbers closer to zero indicate agreement with other laboratories) | | | | |
|---|---|---|---|---|---|---|
| | | SRS1011 | SRS1012 | SRS1013 | SRS1014 | SRS1015 |
| 101 | Saturated Paste Moisture | -0.88 | -0.95 | -1.00 | 0.32 | -1.49 |
| 102 | pH - sp | -2.88 | -3.66 | -3.92 | -1.84 | -3.38 |
| 103 | ECe - sp | 0.44 | 1.00 | 1.35 | -0.07 | 0.24 |
| 126 | NO3-N Cd. Rd. | -1.67 | 0.40 | 0.08 | -0.87 | -0.81 |
| 134 | PO4-P Olsen/Bicarb (1:20) | -1.62 | 0.47 | -0.25 | -0.82 | -0.23 |
| 145 | K- Bicarb. | 0.86 | 2.76 | 5.02 | 0.89 | 1.16 |
| 169 | Zn - DTPA | 0.24 | 1.64 | 0.69 | 0.03 | 0.40 |
| 170 | Mn - DTPA | 0.99 | 2.60 | 1.83 | 1.00 | -0.01 |
| 171 | Fe - DTPA | 0.18 | 1.20 | 0.78 | -0.97 | 0.57 |
| 172 | Cu - DTPA | 0.67 | 1.33 | 1.42 | 0.12 | 0.45 |