

ALP Program Report



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ALP Overview

Special points of interest:

- An assessment homogeneity of all ALP proficiency materials indicate were highly uniform for Cycle 56.
- Sixty-nine laboratories provided soil pH (1:1) H₂O results, medians ranged from 5.69 - 8.18.
- Soil M3-P ICP for Cycle 56 ranged from 13.8 to 81.1 mg kg⁻¹ with intra-lab stdev MAD values ranging 2.7 - 7.6 mg kg⁻¹ across the five soils.
- Soil M3-K values ranged from 76 - 396 mg kg⁻¹ for the five ALP soils of PT Cycle 56.
- Results for botanical CI indicate a range in concentrations with SRB-2504, having a median concentration of 0.047 %.
- Botanical N by combustion was reported by 43 labs, with two labs showing low bias across all PT materials for Cycle 56.

The Agriculture Laboratory Proficiency (ALP) Program spring 2025 Round Cycle 56 was completed August 14, 2025, with results from one-hundred sixteen labs enrolled from the US, Canada, South Africa, Italy, Guatemala and Philippines. Proficiency samples consisted of five soils, four botanical and three water samples. Analytical methods are base on those published by AOAC, regional soil work groups, the Soil Plant Analysis Council and Forestry Canada. ALP has completed nineteen years of service to Ag laboratory industry.



Data was compiled for each method (test code) and proficiency material. Data analysis of each material include: the number results; grand median value; median absolute deviation (MAD), 95% Confidence Interval; method intra-lab standard deviation (*s*); lab mean, and standard deviation. Additional information on methods and statistical protocols can be found at the program web site.

Proficiency Materials

Standard Reference Soils (SRS) materials utilized for Cycle 56 were: SRS-2506 Knik silt loam, collected Matanuska-Susitna Cty, AK; SRS-2507 Arredondo sand collected Marion Cty, FL; SRS-2508 an Occum fine sandy loam collected Litchfield Cty, CT; SRS-2509 a Cisne silt loam collected Clay Cty, IL; and SRS-2510 a loam collected Magrath, Alberta, Canada. Chemical properties of the SRS materials ranges: pH (1:1) H₂O 503 - 7.82; SMP Buffer 6.22 - 7.39 mg kg⁻¹; Bray P1 (1:10) 8.3 - 450 mg kg⁻¹; SO₄-S 2.2 - 10.9 mg kg⁻¹; M3-K 52 - 334 mg kg⁻¹; M3-Ca 750 - 7411 mg kg⁻¹; DTPA-Zn 0.63 - 1.07 mg kg⁻¹; SOM-LOI 1.79 - 7.31%; CEC 4.7 - 27.2 cmol kg⁻¹; clay 4.7 - 39.8% and NO₃-N 3.6 - 42.2 mg kg⁻¹.

Inside this issue:

2025 Cycle 56 PT homogeneity	2
SRS Results: pH, P, K, SOM	3
SRS total carbon	5
SRB CI results	5
SRB: N, P, K and Cu	6
SRW Results: EC and Na	8
Announcements	9

Standard Reference Botanical (SRB) materials for Cycle 56 were: SRB-2505 chicory leaves from CO; SRB-2506 a potato petiole composite; SRB-2507 a eucalyptus leaf composite from CA; and SRB-2508 a corn plant GS-V6 from MN. SRB median analytes concentrations: NO₃-N 107 - 16,170 mg kg⁻¹; Dumas N 1.38 - 3.76 %; wet digestion total P 0.098 - 0.350 %; total K 0.672 - 9.09 %; total Ca 0.722 - 1.77 %; total S 0.135 - 0.594 %, total B 21.6 - 70.6 mg kg⁻¹; and Zn 16.3 - 38.0 mg kg⁻¹.

Standard Reference Water (SRW) samples represent an agriculture water samples collected: SRW-2501 an irrigation well water sample collected near Mesilla, NM; SRW-2502 a domestic well water collected near Burwell, NE, and SRW-2503 from rapid creek, SD. SRW median concentrations: pH 8.00 - 8.12; EC 0.209 - 476 dSm⁻¹; SAR 0.24 - 0.93; Ca 1.71 - 2.75 mmolc L⁻¹; Na 0.27 - 1.24 mmolc L⁻¹; HCO₃ 2.04 - 3.4 mmolc L⁻¹; and NO₃ 0.010 - 0.328 mmolc L⁻¹.

Homogeneity Evaluations



“..soil pH, Buf pH A&E, Olsen P and SOM-WB analysis Std dev values for Cycle 57 met homogeneity standards.”

SRS material homogeneity was evaluated based on soil test codes pH (1:1) H₂O, buffer pH Adams Evans, EC (1:1), P Olsen, K Olsen, NO₃-N, SOM-WB and DTPA-Zn on analysis of six jars of each PT soil, each analyzed in triplicate by an independent laboratory. Homogeneity results were within acceptable limits for all soils, with the lowest noted for pH H₂O, Table 1. Proficiency soil antecedent moisture contents were: 2.2 ± 0.1, 1.1 ± 0.4, 2.2 ± 0.3, 3.8 ± 0.05 and 4.1 ± 0.1 %, respectively.

Homogeneity was also evaluated on SRB and SRW matrix samples. Botanical results indicate all samples were well homogenized for N, P, Zn and C, with RSD values less than 0.5% of N and C on three of botanical samples, Table 2. Water results for EC, Ca, NO₃ and NH₄ were well homogenized with RSD values for EC less than 1% for all three of the PT samples, Table 3.

Table 1. ALP soils homogeneity evaluation Cycle 57, 2025.

Sample	pH (1:1) H ₂ O		EC (dS m ⁻¹)		P Olsen (mg kg ⁻¹)		NO ₃ -N (mg kg ⁻¹)	
	Mean ¹	Std	Mean	Std	Mean	Std	Mean	Std
SRS-2506	5.51	0.01	0.19	0.011	40.2	2.0	15.9	0.3
SRS-2507	6.76	0.01	0.092	0.004	46.1	3.2	2.8	0.2
SRS-2508	6.12	0.01	0.44	0.019	29.4	1.2	33.3	1.0
SRS-2509	4.98	0.02	0.50	0.019	5.2	0.7	41.6	1.5
SRS-2510	7.77	0.02	0.55	0.009	22.2	1.2	13.3	0.5

¹ Statistics based on five randomly selected soil replicates, each analyzed in triplicate.

Table 2. ALP botanical homogeneity evaluation Cycle 57, 2025.

Sample	N (%)		Mg (%)		Zn (mg kg ⁻¹)		C (%)	
	Mean ¹	Std	Mean	Std	Mean	Std	Mean	Std
SRB-2505	3.33	0.047	0.491	0.012	38.67	0.8	43.1	0.23
SRB-2506	3.27	0.102	0.772	0.018	35.1	1.9	39.9	0.14
SRB-2507	3.31	0.067	1.358	0.016	20.7	1.0	36.6	0.19
SRB-2508	0.987	0.027	0.022	0.004	0.78	0.4	40.4	0.28

¹ Statistics based on three randomly selected botanical replicates analyzed.

Table 3. ALP water homogeneity evaluation Cycle 57, 2025.

Sample	EC (dS m ⁻¹)		Ca (meq L ⁻¹)		NO ₃ (meq L ⁻¹)		Na (mg L ⁻¹)	
	Mean ¹	Std	Mean	Std	Mean	Std	Mean	Std
SRW-2504	1.98	0.04	14.8	0.12	0.010	0.004	3.70	0.070
SRW-2505	0.35	0.01	2.18	0.07	0.009	0.003	0.20	0.009
SRW-2506	0.38	0.02	2.92	0.03	0.011	0.004	0.34	0.010

¹ Statistics based on three randomly selected soil replicates, each analyzed in triplicate.