Rev: 03/08, 4/14, 3/16, 1/17, 7/18, 7/20

S890 NORTH AMERICAN PROFICIENCY TESTING PROGRAM OVERSIGHT COMMITTEE

Status:

The purpose of the North American Proficiency Testing Oversight Committee is to set program policy and establish technical guidelines for the operation of the North American Proficiency Testing Program (NAPT) and to assist in the selection and evaluation of the NAPT coordinator and contract laboratory. It is important to coordinate appointments with the Chair of the committee.

Composition and Tenure:

Composition: Voting members of the NAPT consist of the following:

- one representative from the Soil and Plant Analysis Council (SPAC)
- one representative from the Canadian Soil Science Society (CSSS)
- one representative from each of the regional research soil and plant analysis workgroups
    - NCERA-13
    - SERA-6
    - WERA-103
    - NECC-1312
- one representative from a federal agency that oversee soil/plant proficiency programs
- five representatives from the private or public laboratory sectors (with a mix of both) in the following regional areas:
    - Canada
    - Northeast
    - North Central
    - Southern
    - Western

Ex officio members consist of the following:

- NAPT coordinator
- one representative from the NAPT contract laboratory
- one representative from the SSSA staff
- the current SSSA Nutrient management & Soil & Plant Analysis Division chair
- one representative from the NRCS.
- one representative from the SSSA Executive Committee

Committee Role Definitions

- Chair:
    - Annually develop schedule of meetings
    - Preside over meetings
    - Attend Annual Meeting (in person or virtually)
    - Serve on the Budget and Evaluation sub-committee
    - Jointly develop meeting minutes with staff liaison
    - Ensure annual goals are completed for the NAPT committee
    - Call special meetings of the committee when opportunities arise
    - Provide input to issues impacting the program

- Incoming Chair:
    - Should serve on one sub-committee
    - Participate in committee calls
    - Attend Annual Meeting (in person or virtually)
    - Serve on the Budget and Evaluation sub-committee
    - Provide input to issues impacting the program
- Past Chair:
    - Should serve on one sub-committee
    - Participate in committee calls
    - Attend Annual Meeting (in person or virtually)
    - Serve on the Budget and Evaluation sub-committee
    - Provide input to issues impacting the program
- The Chair, Incoming Chair, Past Chair are the leadership team of the NAPT committee.
- Members
    - Serve on and actively participate in at least one sub-committee
    - Participate in at least 50% of the calls and meetings
    - Provide input to issues impacting the program
- Ex-Officio Members:
    - Serve as a resource on operations, issues, new opportunities
    - Participate in calls/meetings
    - Don't vote

Tenure: The term of appointments to the committee will be three years. No one may serve more than two consecutive terms. The appointments will be staggered so that 1/3 of the members will be appointed each year. The Committee Chair will be appointed for a two-year term; at the conclusion of the two-year term as Chair, the Chair will serve as Past Chair for a period of two years. The Chair-elect will be appointed at the start of the Committee Chair's term and will serve as Committee Secretary during that time.

NOTES:

1. Per the committee bylaws, executive officers on the committee (Chair-elect) are elected by the committee members. That name is submitted to SSSA for appointment.
2. Nominees for the representatives of SPAC, NCERA-107, NCR-13, SERA-6, and WERA-103 will be selected by each of their respective organizations.
3. Nominees representing the private laboratory sector will be selected by the Oversight Committee from the pool of NAPT participants and selected to represent geographical diverse regions.
4. The nominee representing the states that have regulatory programs related to soil and plant analysis will be selected by the Oversight Committee.
5. In selecting committee members, efforts should be made to provide a final committee makeup of at least fifty percent representation from the public and/or private laboratory sector.
6. All nominee names are submitted to SSSA for appointment.
7. For those *new* committee appointees who are not current SSSA members and would be unable to join, they will be provided an SSSA membership, at no cost, for the duration of their committee term.
8. The committee officers (Chair, Chair-Elect, Past Chair) continue to represent the group that they originally represented when elected to their committee officer position.
9. The SSSA President-Elect shall be appointed as the SSSA Executive Committee representative

and shall serve for three years. Thus, the appointment for this position shall take place every 3 years.

Overview

The North American Proficiency Testing (NAPT) program assists soil, plant, and water testing laboratories in their performance through inter-laboratory sample exchanges and a statistical evaluation of the analytical data. The program guidelines have been developed for the agricultural laboratory industry by representatives from groups familiar with and involved in standardizing methods and developing nutrient recommendations for soil and plant analysis methods within the US and Canada.

The Performance Assessment Program (NAPT-PAP) is offered as a voluntary service to all soil testing laboratories and operated as a part of the NAPT program and is administered by the NAPT Oversight Committee. The program intent is to develop a means to assess and improve laboratory performance with respect to accurate and precise analytical results using appropriate routine soil analytical methods.

Both the NAPT program and the NAPT-PAP program are programs of the Soil Science Society of America.

Committees:

Membership and Outreach Committee: The goals of the Membership and Outreach Committee are to promote and support the participation in and benefits of the NAPT program to soil testing and plant analysis laboratories throughout North America and to develop and support educational outreach programs and/or other materials that improve the quality of soil testing and plant analysis for all users. Committee responsibilities include but are not limited to: 1) development, review and approval of NAPT promotional materials, 2) organization, coordination and promotion of laboratory-oriented workshops for participating and non-participating laboratories, 3) assistance with the development and testing of Web site materials to promote the NAPT and provide improved member services and 4) review and evaluation of analytical report formats used to provide data to the program participants. Membership and Outreach committee members may also serve as contacts to laboratories in their regions by providing information on program services and benefits to potential participants and by obtaining feedback on NAPT program services and/or member needs from other participants or interested groups with whom they interact.

Quality Assurance/Quality Control and Methods Committee: The Quality Control/Quality Assurance (QA/QC) and Methods Committee will promote the use of appropriate methods as well as QA/QC protocols for soil and plant testing laboratories. Committee responsibilities are to 1) develop materials outlining and promoting QA/QC procedures to be performed within soil and plant analysis laboratories and 2) evaluate and recommend statistical criteria to be used in the NAPT program to define the quality of the analytical data 3) review and promote appropriate methods to soil and plant testing laboratories.

Budget and Evaluation Committee: The Budget and Evaluation Committee will 1) develop and recommend in cooperation with SSSA, the NAPT coordinator and contract laboratory an annual budget for operating the NAPT as a revenue-neutral program, 2) develop and annually review contracts with the NAPT coordinator and contract laboratory and 3) perform an annual evaluation of the NAPT coordinator and contract laboratory and establish a process for recommending and selecting the NAPT coordinator and contract laboratory at contract termination.

PAP Committee: The NAPT-PAP committee oversees the technical guidelines for operating the PAP component of the NAPT program. This includes reviewing and assessing appropriate soil and plant analytical methods with an objective of providing an assessment program that meets the requirements and needs of laboratories for assurance that soil and plant test analyses are being performed using validated testing methods. As PAP laboratories will be graded using standards established by the NAPT Oversight Committee, these standards will be continuously reviewed and adjusted as needed on a yearly basis. The NAPT-PAP Committee will review any complaints, grievances and appeals and work with the NAPT Oversight committee on resolution.

S890 Committee Functions:

Develop technical guidelines for operating the NAPT including selection of sample types, exchange frequency and number of samples per exchange; specifications for material collection and preparation; selection of analytes to be tested and analytical methodologies performed; and specifications of statistical methods used to analyze the analytical data.

Recommend selection of NAPT coordinator and contract laboratory and annually review performance.

Recommend annual program fees.

Plan and organize workshops and continuing education programs related to soil and plant nutrient analysis.

Recommend slate of nominees each year for NAPT Oversight Committee to SSSA President. (The committee members elect their executive officers and submit the names to SSSA for appointment.)

Develop program promotional materials in cooperation with NAPT coordinator.

Facilitate the acquisition of funds to support the NAPT program in cooperation with NAPT coordinator.

Program Operation

Services Provided by SSSA Headquarters

Annually, distribute program membership invoices and collect fees from subscribers. Provide subscriber information to NAPT coordinator.

Distribute information on reference soil samples provided for sale and collect fees.

Contract with proficiency testing coordinator to provide services specified and disburse fees.

Contract with laboratory responsible for preparation and distribution of samples and disburse fees.

Promote the NAPT program including development and maintenance of an NAPT Web site to provide program description and information.

Approve yearly program fees as recommended by NAPT Oversight Committee.

Refer inquirers on NAPT program to NAPT Oversight Committee, NAPT Coordinator, or contract laboratory.

Maintain confidential record of program participants.

Services Provided by NAPT coordinator

Coordinate collection of bulk soil and plant tissue samples.

Coordinate preparation and distribution of samples with contract laboratory.

Collect analytical laboratory data, perform recommended statistical analyses, generate and distribute analytical reports and report summaries. Prepare and distribute annual report summarizing method performance, method comparisons and intra- and inter-laboratory proficiency evaluations. Maintain confidential records of program participants.

Address inquiries related to NAPT program and program reports.

Oversee day-to-day operation and coordination of NAPT program, including monitoring performance of contract laboratory, following policies and technical guidelines established by the NAPT Oversight Committee.

Coordinate with state proficiency program directors to provide state laboratory data in appropriate report format.

Assist in presenting workshops and in developing educational materials in cooperation with NAPT Membership and Outreach Committee.

Develop promotional materials in cooperation with NAPT Oversight Committee. Provide to SSSA headquarters for mailing.

Solicit external funds to support NAPT program in cooperation with NAPT Oversight Committee.

Services Provided by Contract Laboratory

Dry, sieve and mix bulk soil and plant samples following specifications outlined in the NAPT Technical Guidelines. Perform homogeneity testing following specifications developed and split portions into appropriate subsamples for mailing.

Mail soil and plant subsamples to laboratories participating in the NAPT program on a quarterly basis.

Provide bulk storage of soil and plant materials utilized in program.

Coordinate sale of reference soil and plant samples with SSSA headquarters and distribute.

Presidential Responsibilities:

The SSSA President:

Works closely with the Chair to appoint members to the NAPT Oversight Committee as vacancies occur. NOTE: Executive officers (Chair-Elect) are elected by the NAPT committee members. The names are submitted to SSSA for appointment.

Transmits to the chair those matters which the SSSA Executive Committee and/or the SSSA Board of Directors wish the NAPT Oversight Committee to consider.

NAPT TECHNICAL GUIDELINES

Basics of Program Operation: Soils

Soil Types and Exchange Frequency

Soils will be selected to represent dominant soil series of agronomic interest from North America and will have a diversity of chemical characteristics. One soil sample will be replicated in each exchange throughout the year in order to evaluate intra-laboratory precision. Soil materials utilized in the program will be made available for purchase as reference materials.

Bulk Sample Collection

Approximately 220 kg of each soil will be collected. Samples will be evaluated prior to collection based on soil pH, texture, electrical conductivity, nitrate, organic matter and Olsen/Bray P-1 phosphorus. Soils will be collected by either the Program Coordinator or, with approval from the program coordinator, by a designated third party (i.e. participating laboratory, soil fertility researcher, Ag consultant or NRCS personnel). Soil samples will be air dried prior to shipment to contract laboratory and will be shipped in 1 ft^3 plastic containers with sealing lids.

Bulk Sample Preparation

Soil samples will be dried at 35 C in an oven at 100 cfm air flow for 24 hours until dried to a constant weight and pulverized to pass a .85 mm (20 mesh) screen. Homogeneity will be assessed by ten 50g random sub samples and analysis for soil nitrate-N and ammonium acetate extractable potassium using standard methods designated in the NCR-13 and WERA-103 methods manuals. Materials exhibiting an RSD of more than 3 % based on ten sub sample replicates of the specified analyses will be remixed or discarded. Soil meeting minimum homogeneity criteria will be split into portions of 650g, bagged in 6 mil zip-lock bags, and labeled for use in the NAPT program. A minimum of fifty 650g samples will be retained for research purposes. Samples will be stored at a temperature of 25 C and a relative humidity less than 10%.

Analytes and Methods

Participating laboratories will analyze the soil samples for any or all of the analyses listed in Table 1. Methods to be followed will be those recommended by the four U.S. regional workgroups (NCR-13, SERA-6, NCERA-107 and WERA-103) and those listed in the Forestry Canada Methods Manual for Forest Soil and Plant Analysis. The specific test procedures to be initially offered in the program are referenced in Table 1. Analytes and/or methods may be added to or dropped from the program upon approval of the Oversight Committee.

Sample Distribution and Data Collection

Program participants will be preassigned a code for maintaining anonymity. Each quarter, participating laboratories will be provided six soil samples, a letter of instruction and a data reporting sheet. Participants will have 30 days in which to conduct analyses of the samples for analytes of interest by

methods listed in Table 1 and provide results to the program coordinator. Where relevant, information on subsampling techniques (weigh vs scoop) and analytical instrumentation (ICP vs AA or colorimetry) will also be collected from participating laboratories to evaluate the impact of procedural differences within a method on the analytical results.

Initially, data will be collected on either a standardized form or in a spreadsheet program. Ultimately, a WEB site for direct data collection will be developed. The use of an Internet web site will eliminate transcription error on the part of the program coordinator and reduce data communication costs (i.e. telephone and mailing). In addition, the Internet web page could be developed into a data reporting system and provide interactive dialog for laboratories requiring assistance.

Statistical Methods and Program Reports

For each soil analytical method the median and median absolute deviation (MAD) will be determined and warning limits defining the range of acceptable results will be established at +/- 2.5 x MAD units of the median. Statistics will be generated only for those methodologies for which a minimum of 7 laboratories report data.

A summary report of results from the program will be provided to all respondents within 21 days from the date lab results are due to the coordinator. The report will list the overall number of participating laboratories performing each analytical method, minimum value reported, maximum value reported, median, median deviation, percent of laboratories providing results within established warning limits and the individual performance of the participating laboratory. All laboratory results will be kept confidential and the individual results will be the property of the participating laboratory.

With each quarterly report a summary will be provided reviewing method comparisons, outlining quality control and problem solving. Annually each laboratory will be provided a summary report detailing method performance across soils, inter-laboratory accuracy and precision, intra-laboratory precision and overall proficiency. For each of the current state/provincial programs, raw data and a summary will be provided to the state/provincial program coordinator. Raw data without laboratory identifiers will be provided upon request to regional work groups and scientific societies to be used for research and educational purposes.

Each participating lab electing to participate in a state or provincial soil certification program will provide the state coordinator with a copy of their proficiency report each quarter. Exchange sample results will not certify or accredit a particular laboratory, but will signify their analytical performance relative to the group of participating laboratories. For state and federal proficiency program requirements, a report will be prepared semi-annually detailing laboratory proficiencies.

Basics of Program Operation: Plants

Plant Types and Exchange Frequency

Plant samples will be selected to represent major agronomic and horticultural crops (i.e. row, vine, tree, and vegetable crops) from North America and have a range of chemical characteristics. One plant sample will be replicated during the year in order to evaluate intra-laboratory precision. Plant materials utilized in the program will be made available for purchase as reference materials.

Bulk Sample Collection-Plants

Approximately 2 kg of each plant material (dry weight) will be collected. Potential plant materials will be prescreened for collection based on total N, total K, nitrate, and B. Plant materials will be collected

by either the Program Coordinator or, with approval from the program coordinator, by a designated third party (i.e. participating laboratory, soil fertility researcher, Ag consultant or NRCS personnel). Plant materials will be oven-dried prior to shipment to the contract laboratory and will be shipped in sealed plastic bags.

Bulk Sample Preparation-Plants

Plant materials will be dried at 65 C for 24 hours in an oven at 100 cfm air flow and dried material ground to pass an 0.4 mm screen. Homogeneity will be assessed on ten random 8 g sub samples and testing the sample variability for nitrogen by the method of Sweeny (1989) using a total nitrogen analyzer. Materials exhibiting an RSD of more than 3% based on ten sub sample replicates for the specified analyses will be remixed or discarded. Plant materials meeting homogeneity criteria will be split into portions of 12-15 g in 4 mil sealed plastic bags and labeled for use in the NAPT program. Samples are to be stored at a relative humidity less than 10%. A minimum of fifty 8 g samples will be retained for research purposes. Samples are to be stored at a temperature of 25 □C and a relative humidity less than 10%.

Analytes and Methods-Plants

Participating laboratories will analyze the plant samples for any or all of the analytes listed in Table 2. Methods to be followed will be those recommended by the four U.S. regional work groups (NCR-13, SERA-6, NCERA-107 and WERA-103) and those listed in the Forestry Canada Methods Manual for Forest Soil and Plant Analysis. The specific test procedures to be initially offered in the program are referenced in Table 2. Additional analytes and/or methods may be added to the program upon approval of the Oversight Committee.

Sample Distribution and Data Collection-Plants

Program participants will be pre-assigned a code for maintaining anonymity. Each quarter, participating laboratories will be provided three plant samples, a letter of instruction and a data reporting sheet. Participants will have 30 days in which to conduct analyses of the samples for methods listed (see Table 2) and provide results to the program coordinator.

Initially, data will be collected on either a standardized form or spreadsheet program. Ultimately, a web site for direct data collection will be developed. The use of an Internet web site will eliminate transcription error on the part of the program coordinator and reduce data communication costs (i.e. telephone and mailing). In addition, the Internet web page could be developed into a data reporting system and provide interactive dialog for laboratories requiring assistance.

Statistical Methods and Program Reports-Plants

For each plant analytical method the median and median absolute deviation (MAD) will be determined and warning limits defining the range of acceptable results will be established at +/- 2.5 x MAD units of the median. Results from the program will be provided to all respondents within 21 days, listing the overall number of participating laboratories performing each analytical method, minimum value reported, maximum value reported, median, median deviation, percent of laboratories providing results within established warning limits and the individual performance of the participating laboratory. All laboratory results will be kept confidential and the individual results the property of the participating laboratory.

With each quarterly report a summary will be provided reviewing method comparisons, outlining quality control and problem solving. Annually each laboratory will be provided with a summary report detailing performance across plant methods, inter-laboratory accuracy and precision, intra-laboratory precision and overall proficiency. Raw data without laboratory identifiers will be provided upon request to

regional workgroups and scientific societies to be used for research and educational purposes.

Outreach Program

An outreach program including national and regional workshops will be made available to participating laboratories as well as others with an interest in the quality of soil and plant analysis. The program will be organized through representatives of each of the soil and plant analysis regional work groups, state/provincial program representatives, the NAPT Oversight Committee and the NAPT coordinator.

Table 1. Proposed Soil Testing Analytes and Methods for NAPT

Methods are from the following references:

Recommended Chemical Soil Test Procedures for the North Central Region, Bulletin No. 499 (Revised) (January, 1998) (NCR 13)
Recommended Soil Testing Procedures for the Northeastern United States, Bulletin 493 (December, 1995)
NEC67 (http://bluehen.ags.udel.edu/deces/prod_agric/title-95.htm)/
Reference Soil Test Methods for the Southern Region of the United States, Bulletin 289 (September, 1983)
SERA 6
Reference Soil and Media Diagnostic Procedures for the Southern Region of the United States, Bulletin 374
(August, 1992) SERA 6
Western States Laboratory Proficiency Testing Program Soil and Plant Analytical Methods, Version 4.00
(1997)
Methods Manual for Forest Soil and Plant Analysis, Information Report NOR-X-319 (1991) Northwest Region Forestry Canada

Analyte	**Method**	**Analyte**	**Method**
B	Hot water	Total N	Kjeldahl
	Mehlich 3		Combustion
C-Total	Combustion	N03-N	Cd Reduction
CaC03			ISE
CEC	Cation replacement		Chromatrophic Acid
Ca	Ammonium Acetate,	NH4-N	KCL extractable
	Mehlich 1	Na	Ammonium Acetate
	Mehlich 3		Mehlich 3
	Modified Morgan	OM	Loss on Ignition
	Morgan		Walkley Black
Cl	Ca(N03)2 Extr.		POlsen
Cu	DTPA		Bray P1
	Mehlich 1		Mehlich 1
	Mehlich 3		Mehlich 3
EC	1:1 Soil:Water		Morgan
	1:2 Soil: Water		Modified Morgan
Fe	DTPA		AB-DTPA
	Mehlich 1	pH	1:1 Water
	Mehlich 3		1:2 Water
K	Mehlich 1		1:2 0.01 M CaCl2
	Mehlich 3	pH-Buffer	SMP
	Ammonium Acetetate		Adams-Evans
	Morgan		Woodruff Buffer
	Modified Morgan	S04-S	Calcium Phosphate Ext
Mg	Mehlich 1		
	Mehlich 3	Zn	DTPA
	Ammonium Acetetate pH 7		HCL
	Morgan		Mehlich 1

	Modified Morgan	Mehlich 3
Mn	DTPA	
	Mehlich I	Saturated Paste Analytes: Moisture, pH,
	Mehlich 3	EC,HC03, Ca, Mg, Na, SAR, Cl, Div. S-4CSOIL FERTILITY & PLANT NUTRITION, B
	H3P04 Extr.	
		Particle Size Analysis

Table 2. Proposed Plant Analytes and Methods for NAPT

Methods are from the following references:

Plant Analysis Reference Procedures for the Southern Region of the United States, Southern Cooperative
Series Bulletin 368, May 1992.
Western States Laboratory Proficiency Testing Program Soil and Plant Analytical Methods, Version 4.00
(1997)
Methods Manual for Forest Soil and Plant Analysis, Information Report NOR-X-319 (1991) Northwest Region Forestry Canada

Analyte	**Method**	**Analyte**	**Method**
B	Nitric/percholoric	Mn	Nitric/percholoric
	Dry Ash		Dry Ash
	Microwave		Microwave
Ca	Nitric/percholoric	N	Kjeldahl
	Dry Ash		Combustion
	Microwave	Na	Nitric/percholoric
Cu	Nitric/percholoric		Dry Ash
	Dry Ash		Microwave
	Microwave	P	Nitric/percholoric
Fe	Nitric/percholoric		Dry Ash
	Dry Ash		Microwave
	Microwave	S	Nitric/percholoric
K	Nitric/percholoric		Microwave
	Dry Ash		Combustion
	Microwave	Zn	Nitric/percholoric
Mg	Nitric/percholoric		Dry Ash
	Dry Ash		Microwave
	Microwave	$N0_3$	2 % Acetic Acid
		$P0_4$	2 % Acetic Acid
		$S0_4$	2 % Acetic Acid
		C1	2 % Acetic Acid