

Available Services	Instrument / Method	Sample Cost (\$) - - -	
		Canadian Academic	Non-Academic
General Services		(Contact Hongxiu Wang, Agric 5D18)	
Air drying & sieving to 2 mm	---	\$11.00	\$22.00
Coarse grinding	Wiley mill	\$5.00	\$10.00
Fine grinding	Ball mill	\$5.00	\$10.00
Sample weighing & encapsulation (IRMS analyses only)	Sartorius CPA2P balance	\$5.00	\$10.00
Microwave-assisted extraction	Ethos EX microwave extraction system	\$6.00	\$12.00
Microwave-assisted Acid digestion (9mL HNO ₃ +3mL HCl)	Ethos EX microwave extraction system	\$17.00	\$34.00
Microwave-assisted Acid digestion (5mL HNO ₃ +1mL H ₂ O ₂)	Ethos EX microwave extraction system	\$15.90	\$31.80
Extraction for macronutrient analysis	2M KCl; modified Kelowna, Mehlich 3; Bray 1/2	\$5.50	\$11.00
Water extraction: 1:2, 1:5, 1:10 (w/v) soil:water saturated paste	---	\$4.00	\$8.00
Heating block digestion for TP and TN	Heating block	\$6.00	\$12.00
POM and MAOM fractionation	sodium hexametaphosphate	\$9.00	\$18.00
Microbial biomass C and N extraction (fumigation and non-fumigation)		\$15.00	\$30.00
Freeze dryer (per day)		\$20.90	\$41.80
		\$59.00	\$118.00
General Soil Analyses		(Contact Hongxiu Wang, Agric 5D18)	
pH or EC	---	\$4.00	\$8.00
pH & EC	---	\$4.75	\$9.50
Soil moisture content	Gravimetric with oven drying	\$2.50	\$5.00
Cation Exchange Capacity (CEC) & Exchangeable Cations			
Total CEC Prep	---	\$32.50	\$65.00
Total CEC (NH ₄ OAc method)	Seal Analytical AA3 SFA	\$4.50	\$9.00
Effective CEC (sum of cations: Al ³⁺ , Ca ²⁺ , Mg ²⁺ , K ⁺ , Na ⁺)	Agilent 4100 MP-AES	\$30.00	\$60.00
Particle Size Distribution			
Soil texture: Hydrometer method	---	\$12.00	\$24.00
Pipette method	---	\$18.00	\$36.00
Sample prep: Oven-drying and sieving to 2 mm		\$7.00	\$14.00
Removal of CaCO ₃ using 1 M HCl		\$12.00	\$24.00
Removal of organic carbon using 30% H ₂ O ₂		\$28.00	\$56.00
Analysis of metals, S and P		(Contact Hongxiu Wang, Agric 5D18)	
Individual elements: Na, K, Ca, Mg, Fe, Cu, Zn	Agilent 200 Series AAS	\$6.00	\$12.00
Na, K, Ca, Mg, Fe, B, Mn, Cu, Zn, S, P	Agilent 4100 MP-AES (high sensitivity)	\$6.00	\$12.00
Full Scan of available elements: Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Se, Si, Sr, Ti, Tl, V, Zn	ThermoFisher ICAP-RQ (contact Barry Goetz, Agric 2E83)	\$10.00	\$20.00
Total C and N		(Contact Hongxiu Wang, Agric 5D18)	
Soild samples¹			
Total carbon (TC)	Elementar soli TOC cube	\$15.50	\$31.00
Total carbon (TOC + TIC + ROC)		\$18.00	\$36.00
Total organic carbon (TOC)		\$15.50	\$31.00
Total N (TN)	Elementar rapid MAX N exceed	\$9.00	\$18.00
¹ requires fine-grinding of sample			
Liquid samples			
Total Dissolved C (TDC)	Shimadzu TOC-L	\$16.05	\$32.10
Dissolved Inorganic C (DIC)	Shimadzu TOC-L	\$16.05	\$32.10
Dissolved Organic C (DOC=TDC-DIC)	Shimadzu TOC-L	\$24.10	\$48.20
Non-purgeable Organic C (NPOC)	Shimadzu TOC-L	\$16.05	\$32.10
Total Dissolved N (TDN)	Shimadzu TNM-L	\$16.05	\$32.10
TDC+TDN or NPOC + TDN	(see above)	\$24.10	\$48.20
Nutrient Analysis (segmented flow analysis)		(Contact Hongxiu Wang, Agric 5D18)	
Single nutrient: NH ₄ ⁺ -N / NO ₃ ⁻ -N / PO ₄ ³⁻ -P / Cl ⁻	Seal Analytical AA3 SFA	\$4.50	\$9.00
2 nutrient combination	Seal Analytical AA3 SFA	\$6.50	\$13.00
3 nutrient combination	Seal Analytical AA500 SFA	\$8.50	\$17.00
Nitrite N (NO ₂ ⁻ -N)	Seal Analytical AA3 SFA	\$4.50	\$9.00
Total P (TP)	Seal Analytical AA3 SFA	\$5.00	\$10.00
Total Kjeldahl Nitrogen (TKN)	Seal Analytical AA3 SFA	\$5.00	\$10.00

TP + TKN	Seal Analytical AA500 SFA	\$8.00	\$16.00
Stable Isotope Analysis (IRMS-EA) ²			
Solid samples³: $\delta^{13}\text{C}$ and or $\delta^{15}\text{N}$ $\delta^{13}\text{C}$ & %C $\delta^{15}\text{N}$ & %N $\delta^{15}\text{N} + \delta^{13}\text{C}$; %N + %C ¹⁵ N diffusion disks $\delta^2\text{H}$ & $\delta^{18}\text{O}$, Liquid water	(contact Kim Janzen, Agric 5E80) Elementar Isoprime precisION IRMS paired with an Elementar Vario Pyro Cube EA (2 systems)	\$20.00 \$20.00 \$20.00 \$20.00 \$48.00	\$40.00 \$40.00 \$40.00 \$40.00 \$96.00
³ Requires finely ground & encapsulated samples			Request quote
Water samples: $\delta^2\text{H} + \delta^{18}\text{O} + \delta^{17}\text{O}$ water: $\delta^2\text{H} + \delta^{18}\text{O}$ water: $\delta^2\text{H} + \delta^{18}\text{O} + \delta^{17}\text{O}$ soil vapor: $\delta^2\text{H} + \delta^{18}\text{O}$ soil vapor: $\delta^2\text{H} + \delta^{18}\text{O} + \delta^{17}\text{O}$	(contact Kim Janzen, Agric 5E80) (Off-Axis Integrated-Cavity Output Spectroscopy) Los Gatos Research	\$30.00 \$35.00 \$30.00 \$35.00	\$40.00 \$45.00 \$40.00 \$45.00
Water extraction Soil (geochemistry & isotopes) Plant material Plant or soil (geochemistry & isotopes) Plant or soil (isotopes only)	(contact Kim Janzen, Agric 5E80) Centrifugation Centrifugation High-pressure mechanical squeezing Cryogenic extraction	\$20.00 \$25.00 \$30.00 \$30.00	\$25.00 \$30.00 \$35.00 \$40.00
Compound-specific analyses Separation, $\delta^{13}\text{C}$ analysis, & quantification ⁴ of fatty acid methyl esters (methylated neutral and phospholipid fatty acids) Separation, $\delta^{13}\text{C}$ analysis, & quantification of amino sugars (and monosaccharides)	(contact Bobbi Helgason, Agric 5E22) Agilent 8890B GC-FID with 5977B MSD paired to Elementar GC5 interface and precisION IRMS Agilent 1260 Infinity II bio-inert HPLC-RID paired to Elementar LiquiFace interface and Isoprime precisION IRMS		Request quote Request quote
⁴ In development			
Greenhouse Gas Analysis			
Gas chromatography: GHG: (N_2O , CO_2 , & CH_4) GHG + SF_6 high CH_4 samples high CO_2 samples Biogas	(contact Rich Farrell, Agric 5E18) Bruker 450-GC or Scion 456-GC (equipped with ECD / TCD / FID detectors)	\$4.00 \$6.00 \$7.00 \$7.00 \$8.00	12.00 18.00 21.00 21.00 24.00
Isotopic GHG Analysis			
Cavity Ring-Down Spectroscopy⁵ ¹⁵ N_2O ($\delta^{15}\text{N}_{\text{bulk}}$, $\delta^{15}\text{N}\alpha$ & $\delta^{15}\text{N}\beta$) $^{13}\text{CO}_2$ ($\delta^{13}\text{C}$) $^{13}\text{CO}_2$, $^{13}\text{CH}_4$ ($\delta^{13}\text{C}$) IRMS⁵ ¹⁵ N_2O ($\delta^{15}\text{N}_{\text{bulk}}$, $\delta^{15}\text{N}\alpha$ & $\delta^{15}\text{N}\beta$) $^{15}\text{N}_2$ ($\delta^{15}\text{N}$) $^{13}\text{CO}_2$ ($\delta^{13}\text{C}$)	(contact Rich Farrell, Agric 5E18) Picarro G5131- <i>i</i> Isotope & gas concentration Picarro G2121- <i>i</i> Isotope & gas concentration Picarro G2201- <i>i</i> Isotopic analyzer Elementar isoFLOW GHG analyzer paired with an Elementar Isoprime precisION IRMS	\$16.50 \$14.00 \$16.50 \$20.00 \$20.00	\$33.00 \$28.00 \$33.00 \$40.00 \$40.00
⁵ includes total gas concentration by GC			