Agronomy 558

Laboratory Methods in Soil Chemistry (2-3) Cr. 3. Alt. F., offered 2003. Tabatabai. Prereq.: Agron. 354, Chem. 210 or 211. Experimental and descriptive inorganic and organic analyses (chemical methods and the reactions involved). Operational theory and principles of applicable instruments, including spectrophotometry, atomic and molecular absorption and emission spectroscopy, mass spectrometry, X-ray diffraction and fluorescence, gas and ion chromatography, and ion-selective electrodes.

Course Outline:

1. Soil Sampling, Handling, Storage, Errors of Measurements
2. Cation-Exchange Capacity by Ammonium Acetate Method
3. Total Exchange Bases by Ignition-Titration Method
4. Exchange Acidity by Barium Chloride-Triethanolamine Method
5. Hydrogen-Ion Activity and Lime Requirement
6. Soluble Salts by Electrical Conductivity
7. Exchangeable Aluminum
8. Exchangeable Calcium and Magnesium
9. Exchangeable Manganese
10. Exchangeable Potassium
11. Exchangeable Sodium
12. Total Sulfur
13. Organic and Inorganic Forms of Sulfur
14. Total Phosphorus
15. Organic Phosphorus
16. Total Nitrogen
17. Inorganic Forms of Nitrogen
18. Total Carbon
19. Organic Carbon
20. Inorganic Carbon

Demonstrations:

1. X-ray diffraction and fluorescence
2. Ion-specific electrode
3. Gas chromatography and liquid chromatography
4. Colorimeters and spectrophotometers
5. Mass spectrometry
6. Atomic absorption spectrophotometer
7. Flam photometer
8. Carbon and nitrogen analyzers

Text: Sparks, D. L. (ed.) Methods of Soil Analysis. Part 3–Chemical Methods. SSSA Book Series: 5. Soil Sci. Soc. Am, Madison, WI