

Collection Policy: Crop and Soil Sciences

Introduction:

This 2007 collection policy review for the Department of Crops and Soil Sciences comes several years after the Atmospheric Sciences group split off and merged with other campus groups to create the Department of Atmospheric and Earth Sciences. Since then, Crops and Soil Sciences has reorganized into three sections, revised its graduate program and introduced two interdisciplinary majors for its undergraduate program.

1.0 The Department:

1.1 General Information (See department web-page for more information:

<http://www.css.cornell.edu/>):

- 1.1.1 Departmental programmatic focus: plant and soil systems with the aim of promoting productive and sustainable land use practices on regional, national, and international scales
- 1.1.2 Departmental themes: food production systems, sustainable agroecosystem management, and linkages between agriculture and environmental change.
- 1.1.3 Departmental scope: agricultural and non-agricultural landscapes from rural to urban areas
- 1.1.4 Mission: according to the CSS website their research focuses on the intersection of agriculture, the environment, and the new life sciences with the goal of supporting the sustainable and productive management of agroecosystems

1.2 Research:

- 1.2.1 The following lists are illustrative of the current areas being investigated by the faculty in the department and are not intended to be exhaustive. Expect changes as new faculty are hired and others retire. Note that new faculty focus more on crops and less on soils. Newer research programs focus on sustainability, landscape systems, weeds, and biological controls.
- 1.2.2 Crop Science (9 faculty members):
 - Weed science including ecology, life cycles, distribution studies using GPS, weed management programs, biopesticides, affects of climate change on invasive species movement
 - Seed science including life cycles using both in planta and in vitro culture technologies for seeds, zygotic embryos, and somatic embryos.
 - Agronomy research on methods of measuring forage quality, production, and animal performance including the optimization of perennial grass and corn silage utilization by dairy cows
 - Phytoremediation of heavy metal and radionuclide contaminated soils, nutrient pathways in agroecosystems
 - Biofuels production especially the feasibility of grass as a bioenergy source
 - Crop physiology and molecular biology in the study of plant responses to abiotic stress
 - Organic agriculture and weed management, sustainable local food systems
 - The nitrogen cycle in native grasslands and cropping systems and greenhouse gases in agricultural ecosystems
 - Pesticide Management, Integrated Pesticide Management (IPM)
 - Agricultural Systems, ecology at the landscape level, ecological footprint
 - Development of crops and growing practices for biofuels
- 1.2.3 Soil Science (9 faculty members):

- Effects of agricultural management practices on soil biology and microbial ecology
- Soil and water management
- Analytical soil chemistry- tests for trace elements in soil and plant uptake, behavior of trace elements in soils and landscapes
- Plant nutrition related to N recovery and the use of organic matter
- Integrated nutrient management
- Soil Biogeochemistry
- Soil physics/environmental biophysics related to soil quality and fertility
- Mechanisms by which soil minerals can decompose or modify the structure of toxic organic chemicals found as pollutants
- Functions and dynamics of soil organic matter
- Machinery, tillage and precision agricultural equipment
- 1.2.4 Environmental Information Systems (3 faculty members.)
 - Inventory, spatial analysis, and digital map finishing capabilities for expediting the publication of modern soil surveys and environmental resource inventories
 - Integration and analysis of resource inventory data for use in spatially-explicit models and risk assessments of environmental contamination in mixed use landscapes.
 - Examination of agronomic and environmental measurements at varying scales through the use of advanced statistical methods, including geostatistics and data mining.
 - Geographic Information Systems (GIS)

1.3 Teaching:

1.3.1 Graduate Program-

1.3.1.1 Description: As of 2007 the department supports 44 graduate students, 75% of which are foreign. The largest concentration of the department's graduate students is in the Soil Science PhD program, but new sustainable/organic agricultural programs are growing. Most concentrations are research based, but with a focus on developing practical applications. The M.P.S. program is intended as continuing education or practical education for teachers. The program has a strong focus on statistical methods and agricultural sampling methodologies.

1.3.1.2 The graduate program is very diverse with students representing SE Asia, S. America, and Africa.

1.3.1.3 Concentrations (see appendix A for actual classes):

- Environmental Information Science
- Environmental Management (M.P.S. only)
- Field Crop Science
- Soil Science
- Agronomy
- Organic Agriculture

1.3.2 Undergraduate Program

- CSS no longer has an independent undergraduate program. Undergraduate classes offered are for the Agricultural Science, Plant Science, and Science of Natural and Environmental Systems (SNES) majors. Agricultural Science replaced the CNS major in 2005. Full enrollment in each program will be 60-70 students
- See the attached list of courses for specific areas covered by the CSS department.

- Students are required to do multiple research assignments and utilize databases, monographs, and theses
- Many professors are utilizing course reserves and Blackboard to provide material rather than requiring a single text for the class. Library purchase of course texts would be useful.

1.4 Extension:

- 1.4.1 Mission: inform agricultural stakeholders of economic, social, and technological developments relevant to agricultural systems in order to enhance and maintain productive and sustainable farms which are able to respond to a changing world
- 1.4.2 Research programs are focused on practical applications. Information spread by direct consultation, publication in farm and trade journals, and speaking engagements. Work throughout North East and Pennsylvania.
- 1.4.3 Extension activity is of equal importance to research activity within the department.
- 1.4.4 Current Outreach Programs:
 - Cornell Nutrient Analysis Lab (CNAL) <http://www.css.cornell.edu/soiltest/newindex.asp>
 - Cornell Waste Management Institute (CWMI) <http://cwmi.css.cornell.edu/>
 - Forage Valuation Calculator (FORVAL) <http://forval.css.cornell.edu/>
 - Nutrient Management Spear Program (NMSP) <http://nmisp.css.cornell.edu/>
 - Weed Ecology <http://www.css.cornell.edu/WeedEco/>
 - Precision Agriculture <http://www.css.cornell.edu/research/precisionag/>
 - Cornell Institute for Resource Information Systems (IRIS) <http://www.css.cornell.edu/iris/>

2.0 Collection Principles:

2.1 LC Classes:

QE901-996.5
 QR100-130 S590-599.9
 S604.8-621.5
 S622-627
 S631-667
 S671-760.5
 SB113.2-118.46
 SB129-130
 SB599-990.5
 TD878-894
 TD895-899
 TD920-934

2.2 Types of Materials: The following materials are items that were specifically mentioned during a discussion with the faculty liaison. The list is not an exhaustive list of materials to be collected, but rather an account of current needs and commonly used materials. See the attached materials form for additional details.

2.2.1 Databases:

- Web of Science
- CAB Abstracts
- Biosis

2.2.2 Serials:

- The faculty liaison indicated that Canadian soil and agronomy journals are important to the department

2.2.3 Monographs:

- Subject specific
- Course texts

- How-to manuals and demonstrations ie. agricultural equipment
- Weed identification especially materials created by faculty
- 2.2.4 Computer Programs:
 - SASS
 - Sigma Plot 10
- 2.2.5 General geographic guidelines
 - Local
 - New York
 - NE and Pennsylvania
 - Brazil, Argentina, Columbia, Mexico
 - SE Asia and Asia Pacific
 - S. Africa- Sub Saharan and West
 - Australia and New Zealand
 - Not to selectors- geoscope of general U.S. and European materials are of lower priority than similar international materials.
- 2.2.6 General timeframe guidelines
 - Much of the current research is investigating historical methods with a focus on pre-WWII farming practices
 - Current materials published within the past 5 years are also essential to research and teaching efforts
- 2.2.7 Funds and endowments
 - Mann Endowment -- general biology
 - Sherman -- microbiology
 - Clausen – treatises
 - Harlan P. Banks Bookplate -- 2 books in paleobotany, coming from the Biomedical fund
- 2.2.8 Guidelines for support of materials commonly used by:
 - 2.2.8.1 Faculty
 - Materials for faculty research and courses will be given priority over other users.
 - 2.2.8.2 Graduate Students
 - Materials for graduate study and dissertation should be acquired whenever possible
 - 2.2.8.3 Undergraduate Students
 - General course materials for undergraduate study should be acquired whenever possible. Special requests such as senior theses should be reviewed by their faculty advisor.
- 2.2.9 Languages
 - English is preferred.
 - French, Spanish, German and Portuguese are important due to publishing and/or field work locations.

2.3 Current status of the collection:

- 2.3.1 Subject Strengths
- 2.3.2 Subject Weaknesses

3.0 Other notes

3.1 Department contact:

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3.2 Future directions of the department

3.3 Questions for the next review

3.4 Comments on current CDP

Selection Matrix:

Code	IMPORTANCE / INTENSITY CODE DEFINITIONS
NA	Not applicable to discipline.
0	Ephemeral; of insufficient value to be provided by library.
1	Of short term interest, but with little or no enduring value; very selectively acquired; retained, uncataloged, for limited duration only, e.g. newsletters in newly emerging, poorly documented areas, and manuals or pamphlets for reserve reading.
2	Limited scholarly interest or utility; collected very selectively, but not of high priority.
3	Important for research and/or instruction; should be well represented, but collected selectively rather than intensively.
4	Very important for faculty and/or students; intensively collected, i.e. every effort is made to provide as deep coverage of this literature as possible.
5	Essential to work in the discipline; the most important type of material for research or instruction purposes. Ensuring the highest possible coverage should be the library's top priority in this discipline.

Code	Serials
5	Journals, scholarly
5	Journals, technical
-	Journals, other (describe)
5	Annual reviews, advances in ...
4	Scientific and technical reports and research bulletins of major academies, learned societies, professional research and educational organizations and government agencies
3	Proceedings, of international congresses or symposia
3	Proceedings, national or local
2	Statistical series
3	Trade journals and periodicals
0	Popular periodicals, hobby
2	Popular periodicals, semi-technical
2	Popular periodicals, farm press
2	Newsletters/newspapers
2	Proceedings of legislative bodies
2	Student publications
2	Administrative publications of major academies, learned societies, professional, research and educational organizations and government agencies
1	Corporate annual reports

1	Yearbooks
1	Press releases
2	Working papers
3	International Research Center Annual Reports
Code	Monographs
5	Major scholarly monographs
5	Professional and technical
2	Subject histories
3	Textbooks, upper division, graduate
2	Biographies
2	Popular monographs
3	Technical reports/bulletins
3	Government reports
3	Proceedings, international
3	Proceedings, national
2	Theses and dissertations from outside CU
0	Festschrift
0	Patents
0	Corporate histories
2	How-to book/handbooks/ lab manuals
0	Pamphlets
5	Maps
2	Encyclopedias

Created by: R.J. Wagenet; Kerry H. Cook; Sam Demas and edited by Henry Murphy
March 2, 1993.

Revised by Linda Stewart, Susan Riha, and Sam Demas
June 20, 1997.

Full revision by: Heidi Pettitt, Toni DeTommaso, Gregory Lawrence
December 7, 2007.

Appendix A: Courses Offered by the Department- 2007/2008

Crop Science Courses:

CSS 190(1900): Sustainable Agriculture
CSS 311(3110): Grains and Nutraceuticals
CSS 312(3120): Forage Crops
CSS 314(3140): Tropical Cropping Systems
CSS 315(3150): Weed Science
CSS 317(3170): Seed Science and Technology (also HORT 317[3170])
CSS 403(4030): Traditional Agriculture in Developing Nations (also IARD 403[4030])
CSS 414(4140): Tropical Cropping Systems: Biodiversity, Social and Environmental Impacts
CSS 426(4260): Practicum in Forest Farming as an Agroforestry System
CSS 444(4440): Integrated Pest Management (also ENTOM 444[4440])
CSS 455(4550): Mineral Nutrition of Crops and Landscape Plants (also HORT 455[4550])
CSS 473(4730): Ecology of Agricultural Systems
CSS 608(6080): Water Status in Plants and Soils
CSS 610(6010): Physiology of Environmental Stresses
CSS 612(6120): Seed Biology
CSS 613(6130): Physiology and Ecology of Yield
CSS 614(6140): Weed Ecology and Management
CSS 642(6420): Plant Mineral Nutrition (also BIOPL 642[6420])

Environmental Information Science (EIS) Courses:

CSS 397(3970): Environmental Microbiology (also BIOMI 397[3970])
CSS 410(4100): The GMO Debate: Environmental Impacts
CSS 411(4110): Resource Inventory Methods (also CEE 411[4110])
CSS 420(4200): Geographic Information Systems
CSS 465(4650): Global Positioning Systems
CSS 620(6200): Spatial Modeling and Analysis
CSS 621(6210): Applications of Space-Time Statistics
CSS 660(6600): Remote Sensing Fundamentals (also CEE 610[6100])
CSS 675(6750): Modeling the Soil-Plant-Atmosphere System (also EAS 675[6750])

Soil Science Courses:

CSS 260(2600): Soil Science
CSS 321(3210): Soil and Water Management
CSS 362(3620): Soil Morphology
CSS 363(3630): Soil Genesis, Classification, and Survey
CSS 365(3650): Environmental Chemistry: Soil, Air, and Water
CSS 366(3660): The Soil Ecosystem
CSS 371(3710): Hydrology and the Environment
CSS 372(3720): Nutrient Management in Agroecosystems
CSS 412(4120): Whole-Farm Nutrient Management (also ANSC 412[4120])
CSS 421(4210): Soil and Water Management
CSS 466(4660): Soil Ecology (also HORT 466[4660])
CSS 471(4170): Properties and Appraisal of Soils of the Tropics
CSS 472(4720): Nutrient Management and Research in Agroecosystems
CSS 483(4830): Environmental Biophysics (also EAS 483[4830])
CSS 663(6630): Pedology
CSS 666(6660): Applied Plant-Microbe Interactions
CSS 667(6670): Advanced Soil Physics
CSS 669(6690): Organic Matter--Soils, Sediments, and Waters
CSS 671(6710): Soil Chemistry
CSS 672(6720): Nutrient Cycling in Natural and Managed Ecosystems