

# SOIL AND CROP SCIENCE (GRADUATE FIELD)

Program Website (<https://cals.cornell.edu/school-integrative-plant-science/school-sections/sips-soil-crop-sciences-section/>)

## Field Description

Soil and Crop Sciences degree programs offer students the opportunity to develop new knowledge that addresses environmental and agricultural problems related to soils and crops, from fundamental to applied. All graduate degree programs in the Field of Soil and Crop Sciences are individualized to suit students' interests, backgrounds, and goals.

Field crop science covers a wide spectrum, from field-scale applied projects to cell physiology and biotechnology. Studies seek to improve crop productivity and quality, both nationally and internationally, and to identify physiological factors that could be improved through plant breeding or genetic engineering.

Soil science focuses on the processes and properties of the soil environment. It emphasizes improving the suitability of soil for crop growth while preserving its value as a natural resource by using ecologically sound approaches.

The Field of Soil and Crop Sciences occupies a modern and diversified agronomic research facility fully equipped laboratory, teaching, office, and supporting spaces. Growth chambers and greenhouses are on the campus, and there are three main field stations near Ithaca.

## Data and Statistics

- Research Master's Program Statistics (<https://gradschool.cornell.edu/about/program-metrics-assessments-and-outcomes/research-masters-program-statistics/?SelectGradField=5A>)
- Doctoral Program Statistics (<https://gradschool.cornell.edu/about/program-metrics-assessments-and-outcomes/doctoral-program-statistics/?SelectGradField=5A>)

## Field Manual

- Manual (<https://cals.cornell.edu/school-integrative-plant-science/degrees-programs/msphd-graduate-fields/msphd-field-soil-crop-sciences/graduate-field-requirements-soil-crop-sciences/>)

## Subject and Degrees

### Soil and Crop Sciences

- Soil and Crop Sciences (MS) (<https://catalog.cornell.edu/programs/soil-crop-science-ms/>)
- Soil and Crop Sciences (PhD) (<https://catalog.cornell.edu/programs/soil-crop-science-phd/>)

## Concentrations by Subject

### Soil and Crop Sciences

- agronomy
- environmental information science
- field crop science
- soil science

## Faculty

Rachel Bezner Kerr (<http://cals.cornell.edu/rachel-bezner-kerr/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: soil science
- **Research Interests:** agroecology, food systems, International Agriculture and Rural Development

Daniel H Buckley (<http://cals.cornell.edu/daniel-h-buckley/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: soil science
- **Research Interests:** soil microbiology; microbial genetics; microbial ecology; microbial diversity and ecosystem function

Clare L Casteel (<http://cals.cornell.edu/clare-casteel/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; field crop science; soil science
- **Research Interests:** plant-insect interactions, agroecosystem redesign, microbe-mediated climate resilience

Jerome Henry Cherney (<http://cals.cornell.edu/jerome-henry-cherney/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; field crop science
- **Research Interests:** forage production management and quality

Antonio Ditommaso (<http://cals.cornell.edu/antonio-ditommaso/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; field crop science
- **Research Interests:** weed ecology; biological control; integrated weed management

Laurie E. Drinkwater (<http://cals.cornell.edu/laurie-e-drinkwater/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; soil science
- **Research Interests:** soil ecology; nutrient cycling; soil/organic matter dynamics; plant-microbial interactions; soil management; agroecology; biogeochemistry; organic agriculture

Christine L Goodale (<http://ecologyandevolution.cornell.edu/christine-l-goodale/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: soil science
- **Research Interests:** biogeochemistry; carbon cycle; climate change; forest ecosystems; nitrogen cycle

Anthony G Hay (<http://cals.cornell.edu/anthony-hay/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; soil science
- **Research Interests:** microbiology; soil ecotoxicology

Robert Warren Howarth (<http://ecologyandevolution.cornell.edu/robert-warren-howarth/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: environmental information science; soil science
- **Research Interests:** biogeochemistry; human acceleration of nutrient cycles at regional to global scales; watershed management; coastal nutrient pollution, eutrophication, and hypoxia; the effects of biofuels on environmental quality; greenhouse gas emissions and water quality problems from shale-gas development

Bosen Jin (<http://cals.cornell.edu/people/bosen-jin/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; soil science
- **Research Interests:** Environmental chemistry. My research and extension programs apply analytical chemistry, microbiology, soil science, and machine learning to investigate the environmental fate of emerging organic contaminants (EOCs), including per- and polyfluoroalkyl substances (PFAS), pesticides, and pharmaceuticals, in agricultural and soil ecosystems, and to develop sustainable management strategies that protect soil health, water quality, and ecosystem resilience.

Magdalena Maria Julkowska (<https://btiscience.org/magda-julkowska/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: environmental information science
- **Research Interests:** Stress Physiology, High-throughput Phenotyping, Forward Genetics, Molecular Biology

Dan Katz (<http://cals.cornell.edu/daniel-katz/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: environmental information science
- **Research Interests:** Intersection of plant ecology and public health

Quirine M. Ketterings (<http://cals.cornell.edu/quirine-m-ketterings/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; field crop science; soil science
- **Research Interests:** farm nutrient management; soil fertility; fertilizer recommendations; environmental risk indicators

Vipan Kumar (<http://cals.cornell.edu/vipan-kumar/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; field crop science
- **Research Interests:** Weed biology & ecology, herbicide resistance, chemical & non-chemical (cultural, mechanical, biological, and precision) weed control, integrated weed management.

Christopher Johannes Lehmann (<http://cals.cornell.edu/johannes-lehmann/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: soil science
- **Research Interests:** soil fertility management; soil biogeochemistry

Louis Longchamps (<http://cals.cornell.edu/louis-longchamps/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; environmental information science; field crop science
- **Research Interests:** agronomy

Yiqi Luo (<http://www.cornell.edu/search/people.cfm?netid=y12735>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: environmental information science
- **Research Interests:** Global change alters the structure and functions of terrestrial ecosystems, terrestrial ecosystems regulate climate change

Carmen Enid Martinez (<http://cals.cornell.edu/carmen-enid-martinez/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; soil science
- **Research Interests:** Soil chemistry, biogeochemistry, environmental chemistry, soil-plant interactions, metal biogeochemistry, organic matter, soil, soil processes

Andrew James McDonald (<http://cals.cornell.edu/andrew-mcdonald/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; environmental information science
- **Research Interests:** international cropping systems, sustainability

Virginia Moore (<http://cals.cornell.edu/virginia-moore/>)

- **Campus:** Cornell ILR NYC
- **Concentrations:** *Soil and Crop Sciences*: agronomy; field crop science
- **Research Interests:** Sustainable cropping systems

Rebecca Judith Nelson (<http://cals.cornell.edu/rebecca-judith-nelson/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; field crop science; soil science
- **Research Interests:** Bionutrient circularity, organic underutilized resources, circular economy

Varsha Shankar Pathare (<http://cals.cornell.edu/people/varsha-s-pathare/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; field crop science; soil science
- **Research Interests:** Plant Ecophysiology, photosynthesis, hydraulics, climate change

David G Rossiter (<http://www.css.cornell.edu/faculty/dgr2/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; environmental information science; soil science
- **Research Interests:** Spatial modelling and analysis of soil resources.

Jonathan Matthew Russell-Anelli (<http://cals.cornell.edu/jonathan-russell-anelli/>)

- **Campus:** Ithaca - (Minor Member)
- **Concentrations:** *Soil and Crop Sciences*: agronomy
- **Research Interests:** soil and crop sciences

Matthew Ryan (<http://cals.cornell.edu/matthew-r-ryan/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; field crop science; soil science
- **Research Interests:** sustainable cropping systems; cover crops; integrated pest management; weed science

Tammo S Steenhuis (<http://cals.cornell.edu/tammo-steenhuis/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: environmental information science; soil science
- **Research Interests:** water scarcity; scion technical aspects watershed management; international hydrology

Ying Sun (<http://cals.cornell.edu/ying-sun/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: environmental information science
- **Research Interests:** geospatial sciences

Alan George Taylor (<http://cals.cornell.edu/alan-george-taylor/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; field crop science
- **Research Interests:** seed science and technology: aging, storage, quality, coating, enhancement, establishment

Janice E Thies (<http://cals.cornell.edu/janice-e-thies/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; soil science
- **Research Interests:** soil biology and biochemistry; soil microbiology

Harold Mathijs Van Es (<http://cals.cornell.edu/harold-mathijs-van-es/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; environmental information science; soil science
- **Research Interests:** soil and water management; precision agriculture; soil quality; nitrogen dynamics

Olena K. Vatamaniuk (<http://cals.cornell.edu/olena-k-vatamaniuk/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: field crop science
- **Research Interests:** molecular analysis of mechanisms of heavy metal detoxification; analyses of specific aspects of proteome and metabolome response of plants, fungi, and *c. elegans* to heavy metal toxicity

Peter Benson Woodbury (<http://cals.cornell.edu/peter-woodbury/>)

- **Campus:** Ithaca - (Minor Member)
- **Concentrations:** *Soil and Crop Sciences*: environmental information science; soil science

Yun Yang (<http://cals.cornell.edu/yun-yang/>)

- **Campus:** Ithaca
- **Concentrations:** *Soil and Crop Sciences*: agronomy; environmental information science; field crop science; soil science
- **Research Interests:** Geospatial science for sustainable land processes and management Plant water use at field to global scales Impact of agricultural practices using remote sensing