HORTICULTURE (GRADUATE FIELD)

Program Website (https://cals.cornell.edu/school-integrative-plant-science/school-sections/sips-horticulture-section/)

Field Description

Although emphasis is on horticultural plants and systems commonly found in areas of temperate climate, graduate study on species and cropping systems of tropical areas is also possible by use of our extensive greenhouse and growth chamber facilities, and through conduct of thesis research in tropical areas.

Members of the graduate field of horticulture reside in the Section of Horticulture on the Ithaca campus, and at the New York State Agricultural Experiment Station in Geneva. In addition, some faculty members of other sections such as Plant Biology, Plant Breeding, Soil and Crop Science, etc., may also be members of the graduate field of horticulture.

Minor fields of study may be selected from such areas as plant physiology, pathology, anatomy, or ecology; biochemistry; botany; entomology; taxonomy; genetics; education; soils; agricultural, resource, and managerial economics; communication; agricultural and biological engineering; and landscape architecture.

All students receive experience in academic education and Cooperative Extension programs.

Research facilities

At the Ithaca campus, research facilities include laboratories equipped for studies of all aspects of plant physiology, including photosynthesis, pre- and postharvest physiology, biochemistry, biotechnology, photobiology, analysis for chemical elements, and tissue culture. Extensive greenhouse and growth chamber facilities permit varying degrees of plant environmental control. Facilities for postharvest research include rooms for refrigerated and controlled atmosphere storage. Field facilities include two research orchards for study of fruit crops, two vegetable research farms, an outdoor nursery, turfgrass research areas, and the Cornell Botanic Gardens, an extensive botanical garden. At the Agricultural Experiment Station in Geneva, laboratories, greenhouses and growth chamber facilities similar to those in Ithaca are found. In addition, 600 acres of orchards and 200 acres of vegetable experimental farmland are available for research purposes. A wide range of apple, grape, and vegetable germplasm is maintained by the USDA Plant Introduction Station, the National Clonal Repository and the fruit and vegetable breeders. Research is also conducted at the Hudson Valley Lab (fruit research), the Long Island Horticultural Research and Extension Center (grape and vegetable research), and the Fredonia Grape Research Station.

Data and Statistics

- Research Master's Program Statistics (https://gradschool.cornell.edu/about/program-metrics-assessments-and-outcomes/research-masters-program-statistics/?SelectGradField=49)
- Doctoral Program Statistics (https://gradschool.cornell.edu/about/program-metrics-assessments-and-outcomes/doctoral-program-statistics/?SelectGradField=49)

Field Manual

- Manual (https://cals.cornell.edu/school-integrative-plant-science/degrees-programs/msphd-graduate-fields/msphd-field-horticulture/graduate-field-requirements-horticulture/)

Subject and Degrees

Horticultural Biology

- Horticultural Biology (MS) (https://catalog.cornell.edu/programs/horticultural-biology-ms/)
- Horticultural Biology (PhD) (https://catalog.cornell.edu/programs/horticultural-biology-phd/)

Concentrations by Subject

Horticultural Biology

- breeding of horticultural crops
- horticultural crop management systems
- human-plant interactions
- physiology and ecology of horticultural crops

Faculty

Taryn L. Bauerle (http://cals.cornell.edu/taryn-l-bauerle/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** root biology

Bryan Jaret Brown (http://cals.cornell.edu/bryan-brown/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: horticultural crop management systems; human-plant interactions
- **Research Interests:** weed management strategies

Lailiang Cheng (http://cals.cornell.edu/lailiang-cheng/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** metabolic and environmental regulation of photosynthesis; carbon-nitrogen relationships; nutrition, physiology and management of fruit crops

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

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** soil biology

Susheng Gan (http://cals.cornell.edu/susheng-gan/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** plant genomics; molecular regulatory mechanisms and biotechnology of plant senescence; molecular postharvest biology

James Jeff Giovannoni (http://cals.cornell.edu/education/degrees-programs/graduate-field-horticulture/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** genetic regulation of tomato fruit ripening

Benjamin Leo Gutierrez (http://cals.cornell.edu/education/degrees-programs/graduate-field-horticulture/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: horticultural crop management systems; physiology and ecology of horticultural crops
- **Research Interests:** Dr. Gutierrez is the curator of the renowned USDA apple germplasm collection as well as tart cherries. He facilitates using the collection for greatest scientific progress in studies of fruit physiology, genetics, history and improvement. He has expertise in current research tools for investigating genetic diversity and secondary metabolism. He specializes in efficient methods of phenotyping nuances traits on large numbers of genotypes

Yu Jiang (http://cals.cornell.edu/yu-jiang/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: horticultural crop management systems

Jenny T. Kao-Kniffin (http://cals.cornell.edu/jenny-kao-kniffin/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: human-plant interactions; physiology and ecology of horticultural crops
- **Research Interests:** weed ecology; plant-soil interactions; urban ecosystems

Alan Neil Lakso (http://cals.cornell.edu/alan-lakso/)

- **Campus:** Ithaca - (Graduate School Professor)
- **Concentrations:** *Horticultural Biology*: horticultural crop management systems; physiology and ecology of horticultural crops
- **Research Interests:** growth, development, and environmental physiology of apples and grapes

Rui Hai Liu (http://cals.cornell.edu/rui-hai-liu/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: human-plant interactions
- **Research Interests:** diet and cancer; phytochemicals in fruits and vegetables; functional foods/nutraceuticals; herbal remedies for cancer and hepatitis

Jason P. Londo (http://cals.cornell.edu/jason-londo/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** Research on the genetics and physiology of abiotic stress resistance in cultivated and wild grapevine with special emphasis on cold hardiness and drought resistance. Specific areas of study include genomics, population genetics, and plant physiology.

Neil S. Mattson (http://cals.cornell.edu/neil-mattson/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** floriculture; plant physiology; mineral nutrition; crop modeling

William B Miller (http://cals.cornell.edu/william-b-miller/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** floriculture; crop physiology

Charles F. Nicholson (http://dyson.cornell.edu/people/charles-nicholson/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: horticultural crop management systems

Madeline Oravec (http://cals.cornell.edu/madeline-oravec/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology:* breeding of horticultural crops; human-plant interactions; physiology and ecology of horticultural crops
- **Research Interests:** My research program focuses on the genetic understanding and improvement of grapes, with an emphasis on fruit quality, environmental resilience, and biotic resistance. My breeding objectives include developing and releasing novel, resilient, and high-quality wine and table grape varieties and integrating modern phenotyping, genotyping, and selection technologies to improve breeding efficiency.

Gregory Michael Peck (http://cals.cornell.edu/gregory-michael-peck/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: horticultural crop management systems; physiology and ecology of horticultural crops
- **Research Interests:** hard cider, organic agriculture, pomology, soil ecology, sustainable agriculture, systems-level research

Scott J Peters (http://cals.cornell.edu/scott-j-peters/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: human-plant interactions
- **Research Interests:** history of American higher education; public engagement; civic education; community organizing and development; political theory; public philosophy

Marvin P Pritts (http://cals.cornell.edu/marvin-p-pritts/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** cultural practices and physiology of berry crops

Anusuya Rangarajan (http://cals.cornell.edu/anusuya-rangarajan/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** cultural practices with vegetables

Stephen Reiners (http://cals.cornell.edu/stephen-reiners/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** vegetable crop production

Bradley J. Rickard (http://dyson.cornell.edu/people/profiles/rickard.php)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: horticultural crop management systems
- **Research Interests:** agricultural economics; international economics; public policy analysis; horticultural markets

Terence Lee Robinson (http://cals.cornell.edu/terence-lee-robinson/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** orchard management and production systems; physiology of tree fruits

Jocelyn K. C. Rose (http://cals.cornell.edu/jocelyn-kenneth-campbell-rose/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: human-plant interactions; physiology and ecology of horticultural crops
- **Research Interests:** physiology and ecology of horticultural crops, pomology

Sonja M. Skelly (http://cals.cornell.edu/sonja-skelly/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: human-plant interactions
- **Research Interests:** urban horticulture

Lawrence B. Smart (http://cals.cornell.edu/lawrence-b-smart/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** breeding, genomics and physiology of shrub willow as a bioenergy crop; yield trials and variety selection; characterization of gene expression important to biomass production

Christine Durbahn Smart (http://cals.cornell.edu/christine-durbahn-smart/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops

Lynn M Sosnoskie (http://cals.cornell.edu/lynn-m-sosnoskie/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: horticultural crop management systems

Zachary James Stansell (http://cals.cornell.edu/zachary-stansell/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: breeding of horticultural crops; horticultural crop management systems; physiology and ecology of horticultural crops
- **Research Interests:** Dr. Stansell is the curator of the vegetable germplasm collection with USDA-ARS on the Cornell AgriTech campus in Geneva. He has expertise in using genomic tools to understand genetic diversity and is a world leader in doing high throughput phenotyping of important but difficult traits. He also provides excellent guidance and access to an outstanding genetic resource for those studying vegetable genetics, physiology or breeding.

Richard Stup (http://cals.cornell.edu/richard-stup/)

- **Campus:** Ithaca - (Divisional Member)
- **Concentrations:** *Horticultural Biology*: horticultural crop management systems
- **Research Interests:** agricultural human resources and workforce development

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

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** seed and vegetable science

Christopher Brian Watkins (http://cals.cornell.edu/christopher-brian-watkins/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: physiology and ecology of horticultural crops
- **Research Interests:** postharvest physiology of fruit crops

Nancy M. Wells (http://www.human.cornell.edu/people/nmw2/)

- **Campus:** Ithaca
- **Concentrations:** *Horticultural Biology*: human-plant interactions
- **Research Interests:** the effects of the natural and built environment on human health and well-being through the life course