

Collection Policy: PLANT PATHOLOGY

[Subject Scope](#) | [Priority Tables](#) | [Other policies . . .](#)

1.0 TEACHING, RESEARCH AND EXTENSION PROGRAMS

1.1 Mission and emphases of the department

Cornell's Department of Plant Pathology, founded in 1907 by Prof. Herbert Hice Whetzel, was the first department of plant pathology in the U.S. The mission of the department is to discover and disseminate information on the nature and control of plant disease. The department is concerned with both solving current plant disease problems and investigating theoretical issues pivotal to long-term progress in disease control.

1.2 Faculty research

About 30 professorial staff are affiliated with the department, including faculty from the Geneva Experiment Station (which also has a Department of Plant Pathology), the Boyce Thompson Institute, the USDA Federal Nutrition Lab and the Long Island Horticultural Research Laboratory. Another 30 professional plant pathologists are affiliated with the department, including post-docs, research and extension associates, and visiting scientists. The department is highly inter- disciplinary, drawing on and applying basic knowledge in a wide variety of agricultural and biological fields.

Faculty research programs are described in the departmental brochure and [online](#). Research in plant pathology investigates the interactions between plants and pathogens at all levels of biological organization: genetic, molecular, cellular, organismal, population, and community.

1.3 Graduate program

The graduate field of Plant Pathology is one of the largest in the College of Agriculture, with about 50 students, 30% of whom are foreign. Five areas of concentration are offered within the major:

The graduate field of plant pathology offers study in five concentrations:

1. general plant pathology
2. molecular plant pathology
3. mycology
4. epidemiological plant pathology
5. environmental plant pathology.

1.4 Undergraduate program

Undergraduate courses focus on pathogens and the diseases they cause, disease control, integrated pest management, basic and popular mycology, as well as the societal impact of mycology.

1.5 Extension activity

Extension personnel transmit new knowledge on plant disease biology and control to extension agents, growers and consumers. Recent emphases include biotechnology and genomics, fungicide resistance, invasive species, integrated pest management, and environmental issues.

1.6 Noteworthy facilities (e.g. unique classrooms, laboratories, farms, etc.)

In addition to faculty laboratories in Bradfield Hall and the Plant Science Building, facilities used in research include the Dimock

Environmental Control Laboratory, the Virology- Nematology Laboratory, the Uihlein Farm and Laboratory, the Long Island Horticultural Research Laboratory, and a variety of university farms, including a quarantined research farm where golden nematode research is conducted. The U.S. Plant, Soil and Nutrition Laboratory and the Boyce Thompson Institute also provide facilities to members of the field.

2.0 SUBJECT DESCRIPTION AND GUIDELINES

2.1 Subject definition

Plant pathology is the study of:

1. the living entities and the environmental conditions that cause disease in plants;
2. the mechanisms by which these agents produce disease in plants;
3. the mechanisms by which plants react to these agents;
4. the interactions between the disease causing agents and the diseased plant;
5. the cellular and sub-cellular interactions between plant and agents; and
6. the methods of preventing or controlling disease and alleviating the damage it causes.

2.2 Subject scope

Plant pathology encompasses the study of plant diseases caused by: bacteria, fungi, oomycetes, phytoplasmas, nematodes, parasitic higher plants, protozoa, viruses, viroids and environmental toxins.

Research designed to promote plant health in a way which contributes to the sustainability of agriculture is of particular interest today, including: strategies for avoiding the development of pathogen populations resistant to disease control agents; improved plant disease chemicals (i.e. environmentally safe and effective at very low levels of application); improved microbial controls; reduction of postharvest losses; and integrated pest management.

Plant damage caused by insects is investigated by entomologists (though plant pathology includes the study of insects as pathogen vectors) and is treated in the entomology collection policy; damage to crops by animals is treated in the agronomy collection policy. While the emphasis is on diseases of horticultural and field crops, both temperate and tropical, the department is also interested in plant disease in natural communities.

Specific topics comprising plant pathology include:

1. Parasitism and disease development. Plant virology, plant bacteriology, mycology, plant nematology; parasitism and pathogenicity. Host range of pathogens; stages in the development of disease in plants, life cycles of pathogens; basic research on the genetics, molecular biology, biochemistry and physiology of host-parasite interactions; plant- parasite coevolution.
2. How pathogens attack plants. Mechanical and chemical (enzymes and microbial toxins) forces of pathogens; growth regulators in plant disease;
3. Effects of pathogens on plant physiological functions, including photosynthesis, translocation, respiration, transcription and translation of genetic material; quantification of the effects of pathogens as constraints to plant productivity.
4. How plants defend themselves against pathogens: structural and metabolic defenses.
5. Genetics of plant disease. Variability in organisms; types and durability of plant resistance to pathogens; genetics of virulence and resistance; plant pathology and the breeding of resistant varieties.
6. Environmental effects on plant disease development, including temperature, moisture, wind, light, pH, nutrition, herbicides, and atmospheric pollutants.
7. Epidemiology and population aspects of plant disease. Detection, identification, and quantitative analyses of epidemics of pathogens; population dynamics of pathogens in time and space; interactions of pathogen and plant populations; disease in natural communities; applications of theory and modeling to disease management; forecasting epidemics; farmer-warning systems.

8. Control of plant diseases. Quarantines, inspection, and seed and stock certification; cultural, biological, physical and chemical control methods that eradicate or reduce the pathogen inoculum; immunization; improving resistance; direct protection through biological controls (fungal and bacterial antagonists) and chemical controls (i.e. fungicides and antibiotics applied as foliar sprays and dusts, as seed or soil treatment; treatment of tree wounds; and control of postharvest diseases); integrated pest management.

9. Microbial molecular biology and agricultural biotechnology, plant tissue culture systems.

10. Systematics of fungi and plant pathogenic bacteria. Details on coverage will be included in the Systematics collection policy.

Materials for the home gardener are collected selectively.

Exclusions: Mann does not collect on diseases of grapes. This area is collected at the Agricultural Experiment Station in Geneva. The Horticulture Department is creating a joint viticulture/enology program that is slated to begin Fall 2005.

2.3 Emerging trends in the subject area

Trends in biology that affect plant pathology including microbial genetics, photobiology, biotechnology and disease resistance. Watch specifically for oomycete biology.

3.0 SPECIAL INFORMATION NEEDS AND RESOURCES

3.1 Special information needs of those working in this subject area.

Bibliographic databases, including BIOSIS Previews, AGRICOLA, CAB Abstracts, Science Citation Index, PubMed and molecular biology tools from NCBI.

3.2 Special collections or noteworthy resources in the field

3.3 Endowment funds or special funding arrangements

Mann Endowment -- General biology

Burnham -- Botany

Ferguson -- Botany

Clausen -- Treatises

Powell -- General biology

Sarna -- Genetics

Shaw -- Plant Biology

Hicks -- Horticulture

4.0 TYPES OF MATERIALS

4.1 Priorities for types of materials

[See Priorities Table.](#)

4.2 Geographical guidelines

Western-focus with exception of taxonomical works

4.4 Language guidelines

Emphasis on English

4.5 Chronological guidelines

Primarily current materials. Older taxonomic works in mycology, which are not held in the library, are also of interest.

5.0 OTHER RELATED LIBRARY COLLECTIONS

The Veterinary Library collects general virology and animal virology; Mann collects plant virology only. The Entomology Library is used by plant pathologists for publications on pesticides (e.g. fungicides and antibiotics in agriculture) and integrated pest management. The Physical Sciences provides materials on chemistry and biochemistry.

6.0 POLICY QUESTIONS, COLLECTION NEEDS, FUNDING PROBLEMS OR OPPORTUNITIES

n/a

7.0 PRINCIPAL LC CLASSES

QK 600-635
SB621-795
SB998-N4
SB599-608
SB610-618
SB950-989
QR1-113

8.0 RELATED COLLECTION POLICIES

[ENTO](#)

[GENE](#)

[Horticultural Sciences](#)

[MICR](#)

[PLBI](#) (fungi)

[PLBR](#)

[AGRO](#)

[ECOL](#)

Priorities Table for Plant Pathology

Code	IMPORTANCE/INTENSITY CODES DEFINITIONS
NA	Not applicable to the 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	Notes
5	Journals, scholarly	-
4	Journals, technical	-
NA	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	-
1	Proceedings, of international congresses and symposia	-
1	Proceedings, national or local	-
NA	Statistical series	-
1	Trade journals and periodicals	-
1	Popular periodicals, semi-technical	-
NA	Popular periodicals, farm press	-
1	Newsletters/newspapers	-
NA	Proceedings of legislative bodies	-
NA	Student publications	-
NA	Administrative publications of major academies, learned societies, professional, research and educational organizations and government agencies	-
NA	Corporate annual reports	-
0	Yearbooks	-
0	Press releases	-

0	Lists	-
Code	MONOGRAPHS	Notes
5	Major scholarly monographs	-
2	Professional and technical	-
3	Subject histories	-
5	Textbooks, upper division, graduate	-
0	Biographies	-
3	Popular monographs	-
3	Technical reports	-
4	Government reports	-
1	Proceedings, international	-
1	Proceedings, other	-
0	Theses and dissertations (outside CU)	-
0	Patents	Patent databases useful
0	Corporate histories	-
3	How-to books & lab manuals	-
0	Pamphlets	-
0	Ephemera (describe)	-
NA	Maps	-
-	Technical bulletins/handbooks/compendia	-
Code	ELECTRONIC INFORMATION	Notes
-	Applications programs	-

5	Bibliographic databases	-
-	Bulletin boards	-
-	Fulltext files	-
-	Geographic information systems	-
-	Numeric/statistical files	-
-	Other (describe, taking as much space a necessary)	-

Completed by: Sam Demas; Reviewed by H. Israel; Ed. by Henry Murphy

January 19, 1993

Revised by Linda Stewart, Eric Nelson, and S.A. Slack

August 2, 1996

[Top of
Page](#)

Updated by Philip Davis, Linda Stewart, Eric Nelson, Alan Collmer and George Hudler,

June 30, 2003.