HISTORY OF TEACHING, RESEARCH AND EXTENSION IN VEGETABLE CROPS AT CORNELL UNIVERSITY 1868-1960

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Much of the early part of this history was gleaned from the register and catalogs found in the archives of the University in the Mann Library.

The material is presented in four sections—teaching, research, extension, and staff from 1910 to 1960.

TEACHING

A. N. Prentiss, Professor of Botany and Horticulture, gave lectures on horticulture in 1868-69, the first year of operation of Cornell University. It is not known that vegetables were included in these lectures. Professor Lewis Spaulding, director of the farm, gave "Exercises in Practical Agriculture." Courses of the same nature were given each year from 1868-69 to 1876-77. In 1877-78 a course, Principles of Horticulture, was given and in 1878-79 another course, Practical Horticulture, was added. From 1868-69 to 1878-79 the courses in horticulture were given by Professor Prentiss. In 1879-80 courses in Practical Horticulture and Principles of Horticulture were given by W. R. Lazenby, who later was head of the Department of Horticulture, Ohio State University for many years. The first specific mention of a vegetable gardening course was in 1880-81 when Professor Lazenby offered a course with the title Vegetable Gardening. He also offered courses in Commercial Seed Growing and Laboratory Work and Experiments.

From 1881-82 to 1887-88 courses similar to those offered in 1880-81 were given.

In 1888, Liberty Hyde Bailey came to Cornell as Professor of Experimental Horticulture and offered a course in General and Experimental Horticulture during the winter and spring terms of 1888-89. In 1889-90, Dr. Bailey gave courses in general horticulture throughout the year and these included Principles of Pomology and Vegetable Gardening with three hours of laboratory work a week. Similar courses were given each year from 1890-91 to 1909-10 with the addition of courses on Literature of Horticulture, Greenhouse Construction and Management, and Botany of Cultivated Plants in 1896-97, and Plant Breeding (Professor John Craig) in 1903-04. In 1907-08, L. B. Judson gave a 3-hour course in Olericulture.

Paul Work was appointed Instructor in Horticulture in 1910 and gave courses in vegetable gardening for two terms. In 1911-12, he gave the following courses: Elementary Vegetable Gardening, Vegetable Forcing, Systematic Olericulture, and Advanced Olericulture. In 1912-13 Home Gardening was added to
those given in 1911-12, and in the following year a course covering potatoes, field beans, cabbage, and other cash crops was given in the Department of Farm Crops.

The Department of Vegetable Gardening was established in 1913, with Paul Work as Instructor and Superintendent of the Department. This was the first department of its kind established in an educational institution in the United States. In 1913-14 the following courses were offered: Home Vegetable Gardening, 2 hours credit; Commercial Vegetable Gardening for non-specializing students, 4 hours credit; Commercial Vegetable Gardening for specializing students, 2 terms, 3 hours credit each term; Vegetable Forcing, 3 hours; Systematic Vegetable Crops, 2 hours; Advanced Vegetable Crops, 2 or 3 hours practice either term. Similar courses were given each year in 1914-15, 1915-16, 1916-17, and 1917-18. A course on canning was added in the summer of 1917, but was not continued.

In 1917, Paul Work, who had been Superintendent of the Department of Vegetable Gardening since 1913, went into the Army, and it was decided to place the work in vegetable gardening in the Department of Farm Crops under Professor E. G. Montgomery. By the summer of 1918, all but two other staff members in vegetable gardening had resigned. In October 1918, H. C. Thompson was appointed Professor of Vegetable Gardening and soon took charge of the work in that field in the Department of Farm Crops. This organizational setup was continued until July 1, 1921 when the Department of Farm Crops was discontinued and the Department of Vegetable Gardening was re-established with H. C. Thompson as head. During the time the vegetable work was in the Farm Crops Department, H. C. Thompson was Acting Head of the Department for two years while E. G. Montgomery was on leave. At the end of his leave E. G. Montgomery resigned. The work of the former Department of Farm Crops was divided and placed in the Departments of Agronomy, Plant Breeding, and Vegetable Gardening. One staff position, one assistantship, and one clerical position from the Farm Crops Department were assigned to the Vegetable Gardening Department, along with all of the staff assistants, clerical, and other positions that had been in the Vegetable Crops Division of Farm Crops. In 1921, the staff of the department consisted of two professors, four assistant professors, one instructor, and two assistants. Other permanent employees were a gardener, a foreman, two stenographers, and one clerk.

In 1921-1922 the courses offered were Principles of Vegetable Gardening, 3 hours credit; Vegetable Gardening, Advanced Course, 3 hours credit; Special Cash Crops, 3 hours credit; Home Vegetable Gardening, 3 hours credit; Vegetable Forcing, 3 hours credit; and Systematic Olericulture, 3 hours credit. Research was offered for 3 or more hours each term for graduate students only and Seminar for graduate students both terms. These courses continued for several years with Vegetable Forcing and Systematic Olericulture in alternate years. In 1928-29 the name of the course, Systematic Olericulture, was changed to Types and Varieties. A course entitled Grading and Handling of Vegetable Crops was added in the same year. Vegetable Forcing and Home Gardening were discontinued about this time.

In 1931, at the request of the Department the name was changed from Vegetable Gardening to Vegetable Crops. The request was made because the term gardening was a misnomer as applied to most of the vegetable industry, and because students and others thought of the term as applying to the home garden.

For a number of years beginning in 1922-23 two courses in vegetable gardening were given in the Winter Course and similar courses were given in the Summer Session. These were discontinued about 1940. A course in Morphology and Anatomy was given in 1933-34 and continued through 1937-38, after which it was discontinued. In 1939-40 a course Special Topics in Vegetable Crops was given for graduate students and was continued until 1953-54. After that time, the title was changed to Research Methods in Vegetable Crops and was offered in alternate years. In 1951-52 the course Special Cash Crops was changed to Potato Production and Processing and an advanced course, Handling and Marketing Vegetable Crops, was added. Vegetable Judging was added in 1952-53 as a non-credit course; in 1953-54 a course General Horticulture was given for the first time, and the first course in Vegetable Crops was changed to Commercial Vegetable Production. From 1953-54 to 1960-61, no changes were made in course offerings and in the latter year the courses included the following:

1. Course 3 General Horticulture — 4 hours
2. Course 10 Vegetable Judging, Grading and Identification — 1 hour
3. Course 11 Commercial Vegetable Production — 4 hours
4. Course 12 Handling and Marketing Vegetable Crops — 3 hours
5. Course 22 Potato Production and Processing — 3 hours
6. Course 101 Vegetable Crops, Advanced Course — 4 hours
7. Course 112 Handling and Marketing Vegetable Crops, Advanced Course — 4 hours
8. Course 113 Kinds and Varieties of Vegetables — 3 hours
9. Course 225 Research Methods in Vegetable Crops — 4 hours
10. Course 229 Special Topics in Plant Science Extension — 1 hour
11. Course 231 Undergraduate Research, fall and spring terms — Credit one or more hours a term.
12. Course 232 Seminar — fall and spring terms

Required of graduate students taking either a major or minor in the department.
Graduate Training

Some graduate training involving vegetables was given in the Department of Horticulture from about 1890 to 1913. Several graduate students assisted Dr. L. H. Bailey and Professor John Craig on various types of experiments with vegetables during the period mentioned. A considerable number of graduate students of the period became leaders in the field of horticulture in colleges of agriculture, state experiment stations, and the U. S. Department of Agriculture.

From the establishment of the Department of Vegetable Gardening in 1913 until 1919, no graduate training was offered in the field. The graduate students registered for work with vegetables in 1920 and 1921 were listed as majors in Farm Crops. Vegetable Gardening was not recognized as a graduate subject until 1922. The first Master's Degree was granted in 1922 and the first Ph.D. in 1924. Up to June 1960, graduate students taking work in the Department included the following:

- Major for the Ph.D. Degree 97
- Minor for the Ph.D. Degree 43
- Major for the Master's Degree 47
- Minor for the Master's Degree 16
- Majors who received no degrees 37

The 47 majors for the Master's Degree include only those who did not continue for the Ph.D. Degree. Many of those who obtained the Ph.D. Degree had been granted the M.S. Degree previously. The 37 graduate students who received no degree included 12 who were in residence for one year, four for two or more years, ten for one semester and the others for one or two summer sessions or for a part of a semester.

Most of the graduate students who completed work for either the M.S. or Ph.D. Degree engaged in professional work in colleges of agriculture and agricultural experiment stations in the United States and in several other countries. Several of the foreign students are or have been in ministries of agriculture in their home countries, including the Minister of Agriculture of the United Arab Republic. The list of former graduate students includes deans and assistant deans of the colleges of agriculture, directors of experiment stations, head of departments of horticulture or vegetable crops, and heads of divisions of vegetable crops in departments of horticulture. Several are engaged in U. S. Government work in the U. S. Department of Agriculture and International Cooperation Administration. Several others are engaged in professional work in industry, such as chemical companies, the food industry and others. Only a few are engaged in work unrelated to the field of agriculture or to their professional training.

RESEARCH
From 1879 to 1913

The first specific report on experimental work with vegetables was for the year 1879-80, when W. R. Lazenby reported on experiments on seed germination and on fertilization of cucumbers, melons, and squashes. In the same year there were reports on experiments with early peas; on potato culture; on feeding of cabbage leaves, turnip tops, etc. ensiled in the ground for feeding to cattle in the spring; and on feeding value of carrots. Apparently there was not much experimental work on vegetables carried on until L. H. Bailey came to Cornell in 1888. His first publication was Bulletin 7 of the Cornell Station published in 1889 on "The Influence of Certain Conditions upon Sprouting of Seeds." This was a comprehensive study of many factors affecting the germination of seeds of many species, mainly vegetables. From 1889 to 1911, 34 bulletins of the Cornell Station were published on a wide variety of subjects relating to vegetables, including potatoes and field beans.

During the period mentioned, types and varieties of vegetables received a great deal of attention. Dr. L. H. Bailey and his students and associates conducted studies and published results on types and varieties of tomatoes, eggplants, Chinese vegetables, beans, dwarf Lima beans, pole Lima beans, muskmelons, and Physalis or husk tomato. Most of these studies were the first made in the United States and some of them are the only ones. Bulletin 260, American Varieties of Beans by C. D. Jarvis, published in 1908, had wide circulation throughout a large part of the world. It was submitted as a thesis for the Ph.D. Degree. Some of the studies on types and varieties included cultural practices of various kinds. Three reports on the use of electric arc lights on growth of several vegetables were published from 1890 to 1893. In these light experiments, the discovery of photoperiodism was barely missed. Vegetable forcing was given considerable attention and several reports were published including two on "Steam versus Hot Water for Greenhouse Heating." Six bulletins were published on potatoes, one on field beans, and several on other vegetables based mainly on field studies and some experiments conducted at Ithaca. Bulletin 292 by L. B. Judson on "Cauliflower and Brussels Sprouts on Long Island" was published in 1911. One illustration in this bulletin is of a head of cauliflower which appears to show what has been called "browning," symptom of boron deficiency. This illustration is labeled "Section of head showing discoloration caused by soft rot (Bacillus carotovorum)." Soft rot often follows severe browning.

From 1913 to 1960

While some experimental work was started in the early years, after the Department of Vegetable Gardening was established in 1913, it was not until 1919 that research became a major part of the program of the department. Since that time research has been expanded consistently and for a part of the period very
rapidly owing to the interest of vegetable growers, as expressed by the New York State Vegetable Growers Association and other organizations. A large part of the funds made available for vegetable research from about 1922 to 1942 came as legislative appropriations in special bills requested by vegetable growers organizations. The first of these special bills was one appropriating money for the establishment of the Long Island Vegetable Research Farm. This bill was passed in 1922 at the urging of the Farm Bureaus of Nassau and Suffolk Counties and backed by the Vegetable Growers Association and the State Farm Bureau. The total appropriation under the legislation was $46,050 of which $38,000 was assigned to the College of Agriculture and $8,050 to the Experiment Station at Geneva. Of the $38,000 for the College of Agriculture, $26,900 was for the purchase of land, construction and repairs to buildings, and rental of additional land; $4,500 was for supplies and equipment, travel, communication and fuel, light, power and water, and $6,600 for personal service. Personal service included a specialist in vegetable gardening, $3,500; caretaker, $1,500, and miscellaneous labor, $1,800. The $8,050 appropriated to the New York State Station included $6,000 for personal service (entomologist and plant pathologist) and the remainder for laboratory and field equipment, supplies, travel, and communication. The Entomologist and Plant Pathologist on the State Experiment Station budget were later transferred to the Entomology and Plant Pathology Departments at Ithaca.

The responsibility for finding suitable land for the Research Farm was given to the Vice Director of Research, Dr. W. H. Chandler and the Head of the Department of Vegetable Gardening, H. C. Thompson. We were fortunate in finding a suitable farm of 30 acres with two dwellings, two greenhouses, a barn and two other small buildings. It would have been impossible to have purchased 30 acres of land and erected the necessary buildings for the amount of money available. Enough money was available to repair the greenhouse and make some changes in the dwelling houses, one of which was used for offices and laboratories for several years. A two story office and laboratory building was erected in 1931, and a large storage and utility building was built in 1932. In 1956 20 acres of additional land adjoining the Research Farm was purchased. This land had been rented for several years prior to its purchase. Other special appropriations for research on vegetables by the Department included the following:

1. Muck soil vegetables $ 5,400
2. Land survey and classification 10,000
3. Grading and handling of vegetables 5,800
4. Potato production and storage 4,000
5. Vegetable breeding 10,000
6. Lettuce improvement 5,000
7. Potato rotation 5,000
8. Potato extension 5,000

After about 1940, new items were placed in the regular budget.

In addition to the special items mentioned above and the regular appropriations by the Legislature and funds received from the Federal Government, many thousands of dollars have been received in grants from other sources. The first such grant was made by the New York Canning Crop Growers Association in 1920. Since that time dozens of grants have been received from a large number of commercial firms, foundations, and other organizations. In 1960 ten such grants were received involving about $11,000.

Research Publications

One measure of the research is the number of research papers published by the staff and graduate students. From about 1920 to 1960, the papers published giving results of research include the following:

40 Experiment Station Bulletins
22 Experiment Station Memoirs
125 Papers in the Proceedings of the American Society for Horticultural Science
67 Papers in the American Potato Journal
11 Papers in Plant Physiology
27 Papers in Proceedings of Northeastern Weed Control Conference and in Weeds
42 Papers in other publications such as Botanical Gazette, Food Research, Farm Research, Annual Report of the Vegetable Growers Association of America, and Proceedings of the International Horticultural Congress.

In addition to the publications mentioned, hundreds of items have been published in agricultural and horticultural magazines, Farm Bureau and County Extension Service News, and daily papers.

The best measure of the results of research is the use made of them by the vegetable growers and others interested in the application of the results. Growers and others have been very quick to apply results of research to their problems. In many instances, they have urged that recommendations be made before the research workers were ready to make them and often before the results were published. Many years ago a committee of growers came to the College to talk with the Dean and the Head of the Department to discuss a problem and to urge research on it. I was asked to explain what was being done and what had been published on the subject. The Dean then asked one of the growers if he paid any attention to the published results. His reply was that by the time the results were published, the growers had them in practice two or three years as a result of seeing the experiments and discussing them with the workers. Results of many experiments were put into practice before they were published.
Graduate Students' Contribution to Research

From 1920 to 1960 about 175 graduate students, most of whom were assistants, made very important contributions to research of the Department through their assistance to staff members and their own research. Many of the papers mentioned above were contributed by the graduate students alone or as joint papers by the students and staff members.

EXTENSION

The first specific reference to extension work in New York State is in Bulletin 110, published in 1896. An appropriation of $8,000 was made in 1894 for horticultural experiments, investigations, instruction and information in the Fifth Judicial Department. The area included mainly the fruit-growing region of Western New York and the first meetings, held in December 1894, were devoted to fruit growing and general subjects. Meetings held in 1895 and 1896 included sessions on vegetables. In 1895 the appropriation was increased to $16,000 and in 1897 the amount was increased to $25,000. The work under the legislation of 1897 was to include the entire state and agriculture in general. From 1894 to 1902 six reports were published as bulletins giving the results of the work. A considerable part of the extension work from 1894 to 1902 consisted of extension schools at which many subjects were discussed. The first school held at Fredonia in December 1894 listed the following subjects:

1. How plants grow. W. W. Rowlee, Assistant Professor of Botany
2. An analysis of landscapes. L. H. Bailey, Professor of Horticulture
4. Observations on seeds. L. H. Bailey, Professor of Horticulture
5. The geological history of soils. R. S. Tarr, Assistant Professor of Geology
6. Chemistry of grapes and soils. G. C. Caldwell, Professor of Chemistry
7. Theory of tillage and productivity of land. Director I. P. Roberts
8. What are fungi? E. G. Lodeman, Instructor in Horticulture

Other subjects dealing with fruit growing were included. Later the whole field of agriculture was included in the schools and in Farmers Institutes.

Vegetables were given attention in some of the early schools and in the Farmers Institutes. Some of the institute lecturers were vegetable growers; others were from Cornell, the State Experiment Station, and occasionally, a specialist from another institution took part.

The first full-time vegetable extension worker was A. E. Wilkinson, who was employed as Extension Instructor in 1912 and continued in the position until 1917 or 1918. A second position was added in 1917, and in 1930 a third position was added for canning crops extension work. Later an appropriation was made for potato extension work to give the equivalent of one full-time worker on potatoes. In 1950 a specialist was added for extension work on fruit and vegetable handling and marketing. Later the work was divided so that the vegetable man could devote full time to work on vegetables — both research and extension.

From the establishment of the department in 1913, all staff members have done some extension work and this policy has been continued. Staff members whose main duties are extension also engage in research and/or teaching. For many years vegetable growers have insisted that research workers who have conducted research on their problems present the results and recommendations in extension meetings of various kinds. This has worked out very well for both the staff and for the industry served. The research worker who does some extension work sees the problems in the field and is better able to apply his research to solving them than he would be without this contact. On the other hand, the extension worker who does some research is likely to do a better job of interpreting results than one who has no research of his own.

Extension work covers the whole field of vegetable production and handling, including home gardening, 4-H Clubs, commercial production of crops for market and processing, and all features of handling of the product. All of the usual methods of extension are employed in getting the subject matter to the people who make use of it. These methods include personal letters in answer to questions, circular letters, news articles, radio talks, lectures at meetings, conferences, extension schools, field demonstrations, and subject-matter bulletins. From 1920 to 1960 37 extension bulletins were written by the staff and in addition, a large number of mimeographed reports were prepared. A large part of the extension work is conducted in cooperation with county agricultural and 4-H Club agents.

STAFF MEMBERS 1910 TO 1960

The first staff member to devote full time to vegetables was Paul Work, who became Instructor in Horticulture in 1910, Instructor in Vegetable Gardening and Superintendent of the Department in 1913, Acting Professor in 1917, Professor in 1920-1951, Professor Emeritus 1951; deceased July 1959. Other staff members with periods of service follow:

Albert E. Wilkinson, Extension Instructor in Horticulture 1912-13, Instructor in Vegetable Gardening 1913-1917; resigned, 1917 or 1918. He was County Agent in New Jersey for a few years after leaving Cornell and then was Extension Specialist in Horticulture in Connecticut for many years. Deceased.

E. V. Hardenburg, Instructor of Farm Crops 1912-1919, Assistant Professor 1919-1921, Professor of Vegetable Crops 1921-50. Deceased December 1950.

H. W. Schneck, Instructor 1914-1918, Assistant Professor 1918-1928. Resigned in 1928 to accept a position with Kilgore Seed Company, Plant City, Florida and remained with the company until he retired. In 1960, he was living in Plant City, Florida.