V RESEARCH
An Overview 1/

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Research and extension activities were undifferentiated in the earlier years. This is well illustrated by the fact that Experiment Station Bulletins Nos. 2,3, and 5 were "Reports of Farmers Institutes" held in 1892 at Colton, Garfield, and Pomeroy, respectively. These bulletins record the meeting of the faculty of what is now the "University" with the farmers of the area. A precedent was established that has served the agricultural industry of Washington well over the years. There was a spirited exchange of information starting with President George Lilley, who was also Director of the Experiment Station. He told what the Institution was all about; then other faculty members came on. In the recorded discussions, the farmers seemed to make many significant inputs to the subject matter garnered and recorded at the meeting.

In retrospect, it is amusing to note tenets of faculty of those days which are not so well accepted in the 1980's:

1) Windbreak plantings should be used to ameliorate the weather.
2) Dairying would ultimately prevail as a major industry in the Palouse.
3) Wheat was a commodity of only passing importance--it was "a lazy man's crop". (J. D. Scobey)

1/ Part of History of Agronomy and Soils, WSU. 1984.

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A farmer estimated that the cost of producing a wheat crop was about $9.50 per acre and top yields were put at 25 bushels per acre on annual cropping and about 50 bushels with summer fallowing. The price of wheat locally was quoted at 52¢ per bushel. (In 1894, the price dropped to 18¢ per bushel. The year 1893 was remembered for the wettest fall on record. The wheat rotted in unthreshed stacks and in sacks following harvest. Huge crop losses were suffered.)

As for dairying, one farmer complained of the limited carrying capacity of the native grasses of the uplands. He said it took 15 acres of upland grass to carry one cow. A Pomeroy farmer estimated only 8 acres were required per cow. He called for an "Evergreen grass". Scobey of the college faculty reported that about 20 different species of grasses were being evaluated, and a like number of wheat varieties.

Other subjects covered were smut control in wheat; colic, azoturia, distemper, and bone spavins in horses; sugarbeets; windbreaks; fruit tree culture; and handling and marketing of wheat.

Out of the first 165 (#1-165) Experiment Station bulletins, 57 were deemed to involve what now would be classified as agronomic subject matter. Then there were numerous others dealing with smut and other pest-control problems which were closely linked with modern agronomic subject matter. (See Bul. #167, 1922, pp 61-64 for listing of these bulletins.)

Bulletin #13 dealt with Washington soils (Fulmer and Fletcher, 1894). The opening statement was, "The Chemical Department of this Station began last fall the work of an exhaustive soil survey of the State . . . . . This work will of necessity require a number of years for completion." Today, this seems an amusing understatement, because survey (classification) and analysis of the soils are still in progress and the end is not in sight. The "survey" approach of that time was one of getting

total quantitative chemical analysis of various soils representative of certain areas. The analysis was for the inorganic elements: silica, iron, potassium, phosphorus, calcium, etc. "Only three constituents of the soil are of 'critical' importance to the plant", said the authors: "phosphoric acid, potash, and lime." It was the belief then (Liebig Theory) that the percentage content of the various elements of the total found in the soil was a measure of the fertility of the soil. This Liebig theory has been greatly modified as more became known of soil chemistry and soil fertility. These soils were judged to be largely derived from the bedrock below. Subsequent studies of glaciation activity, volcanic activity, and the aeolian nature of this soil material have greatly altered this concept today. Bulletin #55 (Fulmer, 1902) reported further on total analysis of soils from 80 locations over the state.

Progress toward an understanding of soil science as applied to Palouse soils was contributed by (Sievers and Holtz, 1924). They reported a ten-bushel per acre yield increase of wheat on annual cropping from 100 lbs. of sodium nitrate. (Technology had not made ammonium fertilizers feasible at that time.) They reported that in the high rainfall areas (more than 18 inches) of Eastern Washington, soil nitrogen--not soil moisture--was the limiting factor in wheat production..

In Bulletins #34 and #37 (Piper, 1898) reported on the spread of Russian thistles (Salsola kobi) and called for efforts to eradicate completely this new invader of the State. The railroads were credited with bringing this pest here from the Northern Great Plains. The goal was complete elimination of this weed by destroying all patches before they set seed. This is only one of the many weed battles lost over the years. Experience had taught us that, in general, we have had to learn to live with these pests. Jim Hill mustard, Sisymbrium altissimum, Canada thistle,

Cirsium arvense, and bindweed, Convolvulus arvensis are examples of other lost battles for total eradication.

Bulletin #40 (Fulmer and Heilman, 1899) published the Fertilizer Law and also expounded the Liebig theory of soil fertility and plant nutrition.

Bulletin #41 (Spillman, 1900) deals with the forage plants of Washington.

Bulletin #49 (Heilman, 1901) deals with the complex subject of alkali and alkali soils of the Yakima and Kittitas valleys.

Range conditions of Central Washington was the subject of study reported in Bulletin #60 (Cotton, an agent of the State Experiment Station and USDA, 1904). This may have been one of the first joint efforts of USDA and the Washington Experiment Station with the USDA agronomist being housed with the State Institution.

Bulletin #80 dealt with the growing of alfalfa without irrigation in Washington (Elliott, 1907).

Although Spillman (1909) left the University to join USDA in 1902, he later authored an historic Bulletin #89 on the "History of Hybrid Wheats." Contained in this publication was his historic observation of recombination of plant characters in subsequent generations in ratios later called "Mendelian ratios". He recalled the price of wheat was 18¢ per bushel in 1894 and 25¢ per bushel in 1895. He quoted Girard Clark of Albion extolling hybrid #123 as the best adapted of available varieties for the more than 18-inch rainfall area of Eastern Washington. It yielded as much as 50 bushels per acre on summer fallowed land.

As one reads these Bulletins, one is struck with the versatility of these early pioneers doing research in what later became commonly recognized as agronomic subject matter. They dealt with a wide range of

crops and conditions. Considering the limited number of personnel available, they must have been prodigious workers. They set a pattern that has become a tradition with the agronomists at WSU for working diligently. With further experience and study, with greater elaboration of theory and practice, some of these ideas and conclusions now appear primitive and erroneous. They serve to remind us that each succeeding generation of agronomists stands on the shoulders of their predecessors--hence has gained a clearer picture of the truth. Sobering is the contemplation of what in today's theories and ideas also may be erroneous and will be judged redundant by succeeding generations of agronomists. (Deming, the well-known chemistry teacher and author of a much-used text in General Chemistry from the University of Nebraska is reported to have lamenated: "It's frightening to contemplate the number of students flunked in chemistry for not knowing what we later learned wasn't true.") The process of seeking the truth and refining knowledge continues. Each generation is blessed with a bit more of the whole picture and of the ultimate truth.

Surely, we are indebted to our pioneer agronomists (by whatever name) for their courage, initiative, industry and dedication that paved the way for the research and extension programs of today. Early on, they gathered together the knowledge of agronomic science that serves the present day researchers so well as a firm base for further growth and development of the body of knowledge known as "agronomic science".

Out of the Department of Agriculture of the Experiment Station emanated these scholarly reports from people teaching in other departments and colleges. Among the first to bear the title of "agronomist" were Clark Carlyle Thom, Edwin C. Schafer, and Edward F. Gaines in about 1914. With the advent of Holland as President, a reorganization took place in 1916. The Department of Agriculture was divided into eight departments.

Including the "old timers", Horticulture and Forestry, there were then ten departments in Agriculture. Of these, there were Farm Crops and Soils (Johnson, 1929 Chinook.) Apparently these two were in some way linked together with Soils referred to as the "Soils Section". The two were consolidated into the Department of Agronomy February, 1, 1928 (Thirty-seventh Annual Catalogue of State College of Washington, June 1928, p 80). In 1969, the name was changed to Department of Agronomy and Soils.

Expansion of faculty and increasing numbers of publications began in the late thirties but really exploded following World War II. Another trend was that of specialization. Early scientists--Spillman, Fulmer, Piper, and others--wrote about a wide range of subjects, both plant- and animal-related. Symbolic of the 50's, 60's and 70's has been the trend toward more and more specialization. Thus the agricultural research faculty has been concentrated in the College of Agriculture. Faculty of the College of Arts and Sciences likewise has focussed attention on non-agricultural research with more specialization in the pure sciences rather than in the applied.

Close cooperation with USDA was manifested in many ways. The fact that some of those most prominent employees of USDA came from WSU in the early 1900's would suggest a close relationship between USDA and the agronomists of WSU. Spillman, 1902; Piper, 1903; Beattie, 1911; and McCall, 1920 are illustrious examples of scientists of WSU engaged in agronomic work that attracted the attention of USDA and resulted in their leaving WSU for subsequent employment with USDA.

Over the years, the relationship between state agronomists and USDA personnel located with the Department of Agronomy at WSU has been a most sanguine affair. Indeed, the relationship has been as though they all worked for the same agency. In the larger sense, this was true: they

worked for the agriculture of the State, the Region, and of the Nation. There was no standing on formalities based upon which agency employed them. The agronomists all worked together as a team--frank, honest, sincere, friendly. If a USDA employee had a problem--or a complaint--he felt as free to go to the Department Chairman with it as did his state-employed counterparts. The Chairman defended and supported USDA employees as vigorously as he did the state-employed agronomists. There was no difference. And the USDA and State administrators likewise had a confidence and understanding that was unique--no jealousies or prejudices. Both were proud of the relationship and happy with the results of their cooperation and collaboration. As a consequence, there has been a heavy staffing of USDA agronomists with the WSU Department of Agronomy and Soils over the years.

Close cooperation with farmers, business, industry and within the Department. The Farmers Institutes, begun in 1892, set the trend for close communication between farmers, business and industry. The land-grant concept called for mission orientation in teaching, research, and extension. This meant practical application to problems of agriculture as the goal, regardless of how profound or involved were the pursuits of the College of Agriculture. In 1949, Advisory Boards consisting of representatives of farmer, business and industry organizations were proposed. During the next few years, the Department of Agronomy developed one of the most elaborate and largest of these boards. Former WSU student officer and Regent, State Representative and farmer, Harry Goldsworthy of Rosalia, was the first Chairman of this Agronomy Advisory Board in 1951. He was succeeded by John Miller of Garfield, and then by Carl Beckley of Benge. They provided strong and imaginative leadership. The Board was subdivided into three groups, or sections, according to interests: Cereals

(cash crops), Forages, and Soils. Meetings of the entire Board, and also of the Sections were held periodically. Minutes were taken and subsequently published for all participants and for the administration of the College. This Board activity provided excellent exchanges between the WSU agronomists and related staff people with these groups. The Department gained clear impressions of the needs visualized by these constituents, and these programs. Much good from the Advisory Board activity accrued to the Institution, to the constituents, and to the agriculture of the State.

Coordination of research efforts and information. Agronomists and/or agronomic work were located at the seven branch stations across the State--eventhough a very large contingent of faculty was at the main station, Pullman. Communications and cooperation were the measure of success both in obtaining and dissemination of a coherent, consistent stream of information. Agronomists at Prosser or Puyallup had to feel as close to agronomists at Pullman as at another branch station--and vice versa. The use of telephones, correspondence, and much travel were all essential to eliminate the barrier of distance for good communication. Additionally, agronomists of kindred interests and activities had to meet to share their information and to plan together the strategy of research or information dissemination. Consequently, annual meetings were held of research workers dealing with special commodities, e.g., wheat, barley, peas and lentils, forages. There were also periodic meetings of soil fertility specialists, weed control scientists, etc. Regional meetings of these groups from the three states of the Pacific Northwest were also held with good effect.

These activities were enhanced by the development of commodity commissions such as "wheat", "pea and lentil", "potato" which established research committees. These commissions were legalized through enabling legislation that provided for assessments on the commodity produced and

marketed in the State. A portion of these assessment funds was used to supplement State and Federal funds for specific research projects and some extension activities. These commissions were made possible by the growth of commodity group associations which initiated and supported the commissions. The commissions were, non-political action agencies under the supervision of the State Department of Agriculture, whereas the associations could engage in non-partisan political activities for the good of their commodity and their business.

Trends in faculty composition. The years 1980 - 1984 witnessed a great change-over in the faculty of the Department, occasioned by wholesale retirements. Following World War II, there was a great increase in funding for the Universities. consequently, there was expansion of faculty. The available personnel were mostly young male Ph.D.s who had just returned from the armed forces. And now these people have reached retirement age. The Civil Rights movement and the enlightened outlook on equal opportunity for people of either sex and any ethnic background enhanced the supply of minorities and women who now compete for these employment opportunities. These people have been increasingly successful in competing for employment on the faculties and thereby have enhanced and enriched the faculty in the eighties. The faculty has become "all American" in the broadest sense. This transformation has been good.

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