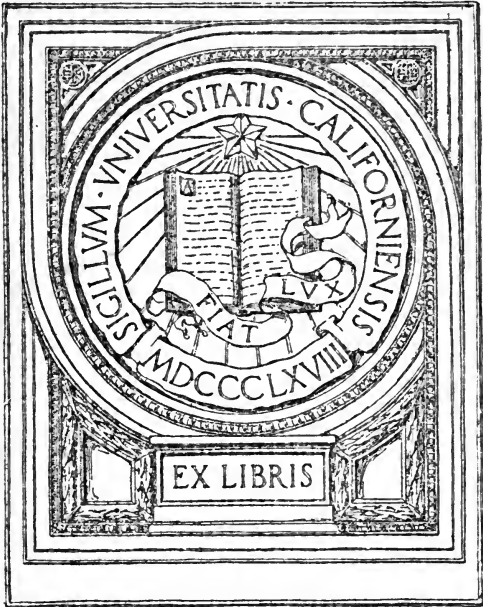


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BULLETIN OF THE UNIVERSITY OF WISCONSIN
No. 441. High School Series, No. 12.

THE HIGH SCHOOL COURSE IN
AGRICULTURE

BY

K. L. HATCH

*Associate Professor of Agricultural Education
The University of Wisconsin*



The University of Wisconsin
MADISON
1911

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Copies of these bulletins may be obtained by writing the Secretary of the Committee on Accredited Schools, Room 119, University Hall.

Entered as second-class matter June 10, 1898, at the post office at Madison, Wisconsin, under the Act of July 16, 1894.

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PREFACE

About fifteen years ago the question of industrial education, including instruction in elementary and secondary agriculture, began to receive serious attention in this state. The matter was earnestly discussed in public meetings, teachers' associations and institutes, educational journals and the daily and weekly press. Finally a committee was appointed by the state legislature to investigate the subject and report its findings. Acting upon the suggestions of the resultant report, the state legislature in 1901 enacted a law, providing for the establishment of county schools of agriculture and domestic economy and the examination of teachers in elementary agriculture. Four years later the teaching of agriculture in the common schools of the state was made compulsory. Efficient courses were worked out for the county schools and are now being successfully administered in these institutions. Secondary instruction in agriculture has already demonstrated its value as a means of education, but thus far little has been accomplished in further extending it to the high schools of the state. Now that The University of Wisconsin has accepted agriculture as fulfilling the requirements for admission, the standing of the subject and its fuller appreciation are assured.

With the expectation that instruction in agriculture will find its way into the high schools of the state this bulletin has been prepared to suggest suitable plans for the carrying out of this work. The copy has been read by C. P. Cary, State Superintendent of Public Instruction of Wisconsin, and approved by him with the understanding that local conditions and future experience will probably necessitate a greater or less degree of modification. We cordially invite correspondence, criticism and suggestions from the teachers who make use of this bulletin. We earnestly hope that this instruction may grow to have a larger share in the education of the high school boys and girls in this state, and through them, contrib-

ute in no small way to the upbuilding and prosperity of the commonwealth.

The writer gratefully acknowledges the valuable assistance of his colleagues in the agricultural college, the members of the University Committee on Accredited Schools, and C. S. Hean, College Librarian, in the preparation of material for this bulletin. He is especially indebted to Supt. Geo. A. Works, Menominee, Wisconsin, Prof. A. C. Monahan of the United States Bureau of Education, and to Prof. D. J. Crosby of the United States Department of Agriculture for reading the manuscript and making valuable contributions thereto.

K. L. HATCH.

SYNOPSIS OF BILL NO. 568, A., LAWS OF 1911.

Section 1. Any board having charge of a free high school or a high school having a course of study equivalent (thereto) . . . may establish and maintain . . . a department of manual training, or domestic economy, or *agriculture*, or any or all of said departments. . . . Any school whose course of study or outline of work in manual training, domestic economy, or *agriculture*, has been approved by the state superintendent, and whose teacher has been qualified may, upon application, be placed upon an approved list of schools . . . (and be entitled to state aid equal to) . . . one-half the amount actually expended for instruction, . . . not, however, to exceed three hundred and fifty dollars for each department established under this act which shall have been maintained in connection with the high school and the three upper grades next below the high school, but not to exceed two hundred and fifty dollars for each department established under this act, which shall have been connected with only the high school.

WHAT OUGHT TO BE FOUND IN A WELL-ORGANIZED AGRICULTURAL COURSE

There are certain things of a general nature which ought to be found in classes in agriculture as well as in other lines of high school work. The more important of these are as follows:

I. A *teacher* who is master of the fundamental principles of agriculture and in complete sympathy with the work.

II. Pupils interested, attentive and alert; quick in response and ready with questions.

III. Material evidences of well planned, everyday work such as:

1. Note books.
2. Collections of materials.
3. Special apparatus.
4. Charts, maps, pictures.
5. Blackboard outlines.
6. Reference books that give evidence of being used.

Aside from these general observations there are certain special phases of the class room work that should be noted.

Since scientific agriculture is largely applied science, i. e., fundamental facts of science applied to the art of agriculture, we should expect to find the botany class paying some attention to plants of economic importance such as the cereals, the legumes, and the noxious weeds.

In physiology the class may be expected to pay some attention to comparative as well as human physiology and anatomy, and in physical geography the teacher may well lay stress upon the "man-side" of the subject.

In physics we should find emphasis placed on machines and other practical applications of this science, and if a course in chemistry is given we may expect to find the chemistry of plant and animal life receiving especial emphasis.

As to the quality of the training in other lines of work obtained from the study of *agriculture*, the pupils should receive thorough instruction in mathematics, in history and in English by the frequent application of all these branches to the study. Particular attention should be paid to accurate statement in both oral and written English in connection with all agricultural work.

WHAT OUGHT NOT TO BE FOUND IN AN AGRICULTURAL COURSE

There are at least four things which should not be found in a well organized agricultural course. They may be concisely stated as follows.

I. Agriculture taught by a city woman, ignorant of farm conditions and farm life.

II. Formal and perfunctory work, of the "question and answer" text book style.

III. The course taken only by students who have partially or completely failed in all of their other work.

IV. The course overloaded with "specialized" forms of agriculture to the exclusion of other important high school work.

THE QUALITY AND QUANTITY OF AGRICULTURAL INSTRUCTION

A course in agriculture to be effective should not differ radically in method of treatment from that of any other established course in high school science. Four units of agriculture, on the basis of a sixteen unit course, may be considered a reasonable standard. A unit of agriculture should represent the same amount of time spent in preparation, recitation and laboratory work as that for a unit of any other science. This will require daily exercises throughout the year.

No attempt should be made to teach agriculture through a distortion of other sciences. Instruction in the fundamental science should precede or run parallel with the *application* of that science to all agricultural instruction.

General courses in elementary agriculture, composed of portions of each of the four units outlined herein, may well constitute one-half to one unit of work. These general courses are sufficiently outlined in several very satisfactory texts already published and need not, therefore, be discussed here. Where more than one unit of work is to be attempted schools are advised not to separate the units outlined herein by giving fragments of each, but to undertake only as many of them as they can institute in a satisfactory manner.

THE PLACE OF AGRICULTURE IN A HIGH SCHOOL COURSE OF STUDY

One of the greatest of modern thinkers in industrial education has recently said:—

“In discussing industrial education, as well as other forms of education, it must be remembered that we are dealing with the man as well as the craftsman, and I use the term craftsman in its broadest sense, to cover the work of the lawyer as well as that of the farmer.

“And this *man*, what of him? Surely he is a factor in the case. He is something more than a farmer or a doctor or a lawyer or else he is something less than a man. His education is not to be limited by the demands of his vocation.”

It is this sort of high school training that the advocates of “vocational” education have taken as their ideal; an education that makes the boy just a little more than a mere farmer or lawyer or doctor and nothing short of a man. If such be a correct ideal, then it remains for the modern high school to modify its course of study so that its completion will fit the child both to make a living and to live. Now this is not impossible of attainment. On the contrary it appears to be both sensible and practicable. For its realization it may be necessary to take a new point of view, to relinquish old traditions and to abandon the use of archaic terms. The real problem, however, lies in the arrangement of courses of study. Means must be provided so that the largest possible number of students may study the things vocational to them in after life. At the same time opportunity should be afforded for the acquirement of an educa-

tion that will in no wise be limited by the demands of their vocations. It is with these problems clearly in mind that the accompanying outlines of units of work in agriculture have been prepared.

GENERAL OUTLINE OF AGRICULTURAL UNITS

FARM MECHANICS—

One half unit in freshman year

FARM MANAGEMENT—

One half unit in freshman or senior year

PLANT HUSBANDRY—

One unit in sophomore year

ANIMAL HUSBANDRY—

One unit in junior year

AGRICULTURAL CHEMISTRY AND SOILS—

One unit in senior year

GENERAL OUTLINE OF BASIC SCIENCES

BOTANY—One-half year in freshman year.

PHYSIOLOGY—One-half year in sophomore year.

CHEMISTRY—One-half year in freshman year or one year in junior year.

PHYSICS—One year in senior year.

Note:—To this may be added: PHYSICAL GEOGRAPHY, one-half year in the freshman or the sophomore year.

The work in farm mechanics and management should treat of the mechanical and business phases of agriculture and, as herein outlined, may be introduced easily during the first year of the course.

There is good reason to favor the introduction of a more complete course in farm management in the last half of the fourth year, as a general summary of all the work in agriculture. This may well follow a course in agricultural economics, of which it would then become a part.

In many instances it will be found advantageous to introduce one half year of elementary chemistry at the beginning

of the work in agriculture. This is especially desirable where chemistry is not already taught as a regular branch in the third or fourth year of the high school course.

The work in plant husbandry should be an outgrowth of that in botany by which it should be preceded. Since botany usually is offered during the first year of the high school course the work in plant husbandry should follow in the second year.

The work in animal husbandry should be preceded by the course in human or general physiology and that of agricultural chemistry and soils by general chemistry.

The following outline is intended to be suggestive and, with but slight modification, may be easily fitted into the courses of study of the majority of schools.

Suggested Arrangement of Work in Agriculture and Related Sciences

FIRST YEAR

Farm Mechanics	Botany
Beginners' Chemistry where no other chemistry is taught	
Electives to make up required number of units	

SECOND YEAR

Physical Geography	Physiology
Plant Husbandry	Plant Husbandry
Electives to make up required number of units	

THIRD YEAR

Animal Husbandry	Animal Husbandry
Chemistry	Agricultural Chemistry
Electives to make up required number of units	

FOURTH YEAR

Soils	Farm Management
Physics	Physics
Electives to make up required number of units	

Note:—The above arrangement permits of great freedom in the selection of electives, preserves the order of arrangement of agricultural subjects and related sciences, summarizes the work in the study of farm management and follows, in a general way, the plan adopted by the American Association of Colleges and Experiment Stations. This will be seen by an examination of the course of study outlined by Dr. A. C. True and approved by that association. (See p. 19.)

Condensed Outline of Each Unit of Agricultural Work

FARM MECHANICS—One-half unit.

- I. MECHANICAL DRAWING:—
 1. Use of instruments.
 2. Ordinary conventions.
 3. Practice in lettering.
 4. Making and reading tracings and blue prints.
- II. BUILDINGS, ROADS AND BRIDGES:—
 1. Drawing plans of barns, silos, and other farm buildings.
 2. Making blue prints of same.
 3. Study of road construction.
 4. Study of culverts and plans for same.

FARM MANAGEMENT—One-half unit

- I. BOOKKEEPING:—
 1. General principles of accounts.
 2. Keeping of farm accounts.
 3. Practice in keeping necessary farm records.
 4. Attention to penmanship, spelling and general appearance.

II. BUSINESS FORMS AND COMMERCIAL LAW:—

1. Making of notes, receipts, bills, etc.
2. Use of weigh bills, bills of sale, etc.
3. Law of contracts.
4. Other principles of Commercial Law as applied to farm transactions.

PLANT HUSBANDRY—One unit

I. PLANT DISEASES:—

1. Microscopical study of fungous plants.
2. Molds, smuts, rusts, blights.
3. Other diseases of plants.
4. Bacterial diseases of animals.

II. AGRONOMY:—

1. Corn judging and testing.
2. Examining and grading grains.
3. Study of weeds.
4. Inspection of clovers and grass seeds.
5. Study of legumes and forage plants.

III. PLANT PROPAGATION:—

1. The use of propagating beds.
2. Potting.
3. Grafting and budding.
4. Rooting cuttings.

IV. GARDENING:—

1. Seed testing.
2. Hot beds and cold frames.
3. Transplanting.
4. Outdoor gardening.

ANIMAL HUSBANDRY—One unit

I. BREEDS OF LIVE STOCK:—

1. Principles of breeding.
2. History of progress made in animal breeding.
3. Standard breeds.
4. Breed characteristics.

II. STOCK JUDGING:—

1. The "points" on the score card.
2. Lantern slide demonstrations.
3. Practice in judging stock easily available.
4. Visits to best herds in vicinity.

III. POULTRY:—

1. Poultry as an economic factor in farm and city life.
2. The care and management of poultry.
3. Feeding poultry and marketing poultry products.
4. Judging poultry.

IV. INSECTS:—

1. Life histories of insects.
2. Collecting and preserving specimens.
3. Insects injurious to our fruits and grains.
4. Means of controlling ravages of insects.

AGRICULTURAL CHEMISTRY AND SOILS—One unit

I. DAIRYING:—

1. Testing milk and its products for fat.
2. Testing for acidity.
3. Testing butter for moisture and salt.
4. Testing milk for impurities and adulterants.

II. FEEDS AND FEEDING:—

1. Protein and fat and their functions.
2. Analyses of feeds.
3. Rations and feeding standards.

III. SOILS AND FERTILIZERS:—

1. Physical analysis of soils.
2. Chemical composition of soils.
3. Classification of soils.
4. Tillage and inoculation of soils.
5. Fertilizing elements of soils.
6. Natural fertilizers including legumes.
7. Commercial fertilizers.
8. Chemical constituents.

IV. DRAINAGE:—

1. Physics of drainage.
2. Principles of drainage.
3. Methods employed.
4. Practice in mapping, ditching and laying tile.

Details of Each Unit of Work**FARM MECHANICS****I. MECHANICAL DRAWING:**

The work in mechanical drawing should begin with practice in the use and care of instruments and a study of the meaning of ordinary conventions. Sufficient practice should be given to insure facility in plain lettering and in making simple mechanical drawings from objects. This work should be concluded with the making and rapid reading of tracings and blue prints. (See Anthony's "Elements of Mechanical Drawing" or Tracy's "Introductory Course in Mechanical Drawing.")

II. FARM BUILDINGS, ROADS AND BRIDGES:

The work in mechanical drawing should lead up to the study of plans for barns, stables, silos, poultry and hog houses and other farm buildings. Students should be required to calculate the quantity and cost of materials and estimate the cost of labor required for these buildings. Original plans for farm buildings may be accepted and should include the necessary tracings and blue prints. This course should be designed to familiarize students with the best practice of mechanics and builders, and enable them to make and interpret mechanical drawings and to prepare reasonably accurate estimates therefrom. Attention should also be given to the convenient, artistic and sanitary arrangement of farm buildings and grounds. The proper method of constructing earth, gravel and macadam roads should be studied. Plans for culverts should be made, their practicability determined, and the cost of construction estimated. (See Roberts' "Farmstead.")

FARM MANAGEMENT

I. BOOKKEEPING:

The general principles of accounts¹ should be studied and practice given in the keeping of farm accounts and necessary records. Special attention should be paid throughout this course to penmanship, neatness and accuracy. Slovenly and inaccurate work should not be permitted. (See Roberts' "Farmers' Business Handbook.")

II. BUSINESS TRANSACTIONS:

Students should be made familiar with ordinary business forms by the writing of notes, receipts, checks, bills, weigh-bills and bills of sale. They should be required to make all necessary computations in connection with these forms and should be made conversant with the law of contracts and certain other phases of commercial law of interest to farmers. The computation of creamery and cheese factory dividends; the cost and returns from various types of farming; the cost of producing special farm crops such as beets, tobacco or cabbage, and the probable returns and profits from each should form a part of this course. (See Roberts' "Farmers' Business Handbook.")

PLANT HUSBANDRY

I. PLANT DISEASES:

This work may well begin with the microscopic examination of bacteria and the spores of a few of the fungous plants. The slides should be prepared and the microscope adjusted by the teacher in charge. This will lead to a study of the ways in which plant diseases and bacterial diseases of animals are disseminated. Molds, smuts, blights, rusts and rots may each be studied in turn, together with methods of prevention and control. It also will be appropriate to study bovine tuberculosis, the tuberculin test and its method of application. The preparation and use of fungicides and disinfectants should receive attention. (See Duggar's "Fungous Diseases of Plants" or Stevens and Hall's "Diseases of Economic Plants" and Russell and Hasting's "Agricultural Bacteriology.")

II. AGRONOMY:

This course should include corn judging, methods of curing and testing seed corn, the examining and grading of grains and grain judging by use of score cards. Work with forage plants should cover the best methods of seeding, curing and harvesting clover, alfalfa, peas, beans, vetches and other legumes. The grain study should include the seeding, harvesting and marketing of barley, wheat, oats, speltz and buckwheat. The study of noxious weeds should consider their characteristics, classification as annuals, biennials and perennials, their habits of growth and their identification by means of the roots, leaves or seeds of plants. Emphasis should be placed upon the inspection of clover and grass seeds and the identification of the foreign seeds they often contain. (See Hunt's "Cereals in America.")

III. PLANT PROPAGATION:

This study should embrace the morphology of the bean, pea, radish, buckwheat, corn and beet with special reference to the germination and development of the young plant. Bulbs, corms, tubers, and other specialized forms of asexual propagation should be observed and compared with seeds to demonstrate that asexual means of reproduction are confined almost entirely to plants. The construction and use of the propagating bed, the making of cuttings, the rooting of them in the propagating bed, the transplanting of these to pots and to open ground, and the proper methods to be employed in potting and repotting should receive attention. The various kinds of grafts and grafting wax should be made and much laboratory work done to familiarize the pupils with the methods and practice of plant propagation. (See Bailey's "Nursery Book.")

IV. GARDENING:

The testing of garden seeds should be the first consideration in this course. Seeds showing a low percentage of viability should only be planted for experimental purposes. Practice in the identification of vegetable seeds is also an important part of this work. The construction of hot beds and cold frames should be studied, this apparatus prepared

and seeds planted therein. When ready these plants may be transplanted to open ground in the school or home garden and used for further plant life study. The daily recitations should consist of a study of the proper methods of soil tillage and cultivation for the various plants under observation. Home decoration and landscape gardening should receive considerable attention during the course. (See Bailey's "Garden Making.")

ANIMAL HUSBANDRY

I. TYPES AND BREEDS OF LIVE STOCK:

The work in this subject may well consist of a study of the history of the various breeds and classes of live stock, the methods used to develop these breeds, the distinguishing characteristics of the standard breeds and the special merits of each. This intensive study of animal life in the high school is confronted by special difficulties. If the school is equipped with pictures, charts, a well chosen collection of animal slides and a good lantern these difficulties may be largely overcome.* (See Plumb's "Types and Breeds of Farm Animals.")

II. STOCK JUDGING:

The theoretical part of this work should be done in the class room by the use of charts, lantern slides and the score card. Practice may be obtained from the scoring of individual animals owned in the vicinity of the school or borrowed from more distant breeders. Competitive judging work can be done by occasional visits to the best herds and flocks in the neighborhood. (See "Craig's "Stock Judging.")

III. POULTRY:

The study of poultry easily may be made a part of the high school curriculum. The birds themselves may be

* Dr. A. S. Alexander of this college has suggested the use of models for this work and such models are now being manufactured by George Ford Morris, 28 West Thirty-third Street, New York City.

brought into the classroom. Specimens of each of the leading varieties of chickens may usually be found within easy reach of the school. Poultry and its proper feeding, care and management should be studied as an economic factor in city and rural life. Practice should be given in judging poultry by means of the score card. The best methods to be used in preparing poultry and its products for market should receive attention. (See Robinson's "Poultry Craft.")

IV. INSECTS:

This work should begin with a study of the life histories of a few of the common insects and should include practice in the collection, mounting and preservation of specimens. Insects like the plum curculio and the codling moth such as are injurious to our native fruits should be studied and those that cause serious damage to farm crops should receive due attention. The laboratory work may well include the preparation and application of insecticides. Other means of controlling these pests should be studied. A school collection of injurious insects and examples of their destructive work should be made. (See Comstock's "Insect Life.")

AGRICULTURAL CHEMISTRY AND SOILS

I. DAIRYING:

A study of the physical and chemical composition of milk should introduce this branch and be followed by the testing of milk, cream, skimmilk, buttermilk and whey for fat by the use of the Babcock test. The Hart casein test should be demonstrated. The various volumetric tests for acidity should be learned and practiced by actual application in the testing of milk, cream, buttermilk and whey. Butter and cheese should be tested for salt and moisture by some of the methods in common use. Practice should be given in the testing of milk and its products for impurities and adulterants. (See Farrington's "Testing Milk and its Products.")

II. FEEDS AND FEEDING:

The composition and value of each of the principal feeds and the compounding of economical and profitable rations are matters of supreme importance in this study and should

be given the attention they deserve. The functions of water, protein, carbohydrates, fibre, fats and ash in feeds should be studied. The chemical relations between the soil, water, air, plants and animals should be clearly established. Practical feeding demonstrations and experiments should be made at home by pupils who live on farms. Considerable attention should be paid to feeding from the practical standpoint. (See Henry's "Feeds and Feeding" and Hart's "Agricultural Chemistry.")

III. SOILS AND FERTILIZERS:

High school work under this head should follow chiefly physical lines with simple exercises in soil chemistry and fertilizer tests of soils of the neighborhood. These tests may be made either in the greenhouse or in the field. Experiments in soil inoculation should also be made. The influence of the various factors on the movement of soil water and its availability, and the water holding capacity of soils may be studied. For class room work the origin and chemical composition of soils may be studied and the best methods of tillage discussed. Fertilizer requirements of the various types of soils should be studied. Students should become familiar with the common commercial fertilizers and the source, composition, value and use of each. (See Whitson and Walster's "Elements of Soil Fertility" and Vivian's "First Principles of Soil Fertility.")

IV. DRAINAGE:

The influence of soil water and its evaporation on soil temperature should be noted. The general principles of drainage, the movement of drainage waters as influenced by soil structure, slope of land, depth of and distance between ditches and tiles should be carefully studied. Practice should be given in measuring distances and calculating land areas and in mapping small drainage areas by the use of the plane table and otherwise. These maps should show size of the area and the position of tiles. Careful estimates should be made of the cost of drainage of each area mapped. Where practicable, practice should be given in ditching and laying tile. (See Elliott's "Farm Drainage" and Jones' "Notes on Drainage.")

SYLLABUS OF A FOUR-YEAR SECONDARY COURSE IN AGRICULTURE

**PREPARED BY THE UNITED STATES DEPARTMENT
OF AGRICULTURE**

Required Subjects

Subjects	Units	First Year	Second Year.	Third Year	Fourth Year	Total Hours
English	3	5	5	3	2	540
Algebra	1	5	.....	.....	.....	180
Geometry	1	.....	5	.....	.....	180
History	1	.....	.....	2	3	180
Botany	1	5	.....	.....	.....	180
Chemistry	1	.....	5	.....	.....	180
French or German.....	2	.....	.....	5	5	360
Agriculture.....	4	5	5	5	5	720
Elective.....	2	.....	.....	5	5	360
Total.....	.....	.....	.....	.....	.....	2,880

Elective Subjects

Subjects	Units	Hours per week	Total Hours
Drawing	1-5	1 hour 1 year....	36
Bookkeeping....	1-5	1 hour 1 year....	36
Civics	2-5	2 hours 1 year....	72
Solid geometry....	1-2	5 hours $\frac{1}{2}$ year....	90
Plane trigonometry and surveying.....	4-5	2 hours 2 years....	144
French or German.....	1	5 hours 1 year....	180
Botany, chemistry, or physics.....	1	5 hours 1 year....	180
Agriculture, horticulture or elementary forestry.....	.....	1 to 5 hours 3rd and 4th years.	.....

Required Subjects for all Students in Agriculture

Subjects	Units	First Year	Second Year	Third Year	Fourth Year	Total Hours
The Plant and Its Environment.....	2-5	2	.....	.....	.....	72
Farm Crops.....	1-5	1	.....	.....	.....	36
Agricultural Engineering...	2-5	1	.....	1	.....	72
Horticulture and Forestry..	1-5	1	.....	.....	.....	36
Economic Entomology.....	2-5	.....	2	.....	.....	72
Animal Husbandry.....	2-5	.....	2	.....	.....	72
Dairying.....	1-5	.....	1	.....	.....	36
Diseases of Plants and Animals.....	2-5	.....	.....	2	.....	72
Farm Management.....	2-5	.....	.....	.....	2	72
Subjects to be added from the subjoined list A.....	1	.....	.....	2	3	180
Total.....	.....	.....	.....	.....	.....	720

A. Subjects from which Selection must be made to Make Up the Required 720 Hours in Agriculture

Subjects	HOURS PER WEEK		Total Hours.
	Third Year	Fourth Year	
Farm Crops.....	2	2	72 or 144
Animal Husbandry.....	2	2	72 or 144
Dairying.....	2	2	72 or 144
Horticulture.....	2	.....	72
Forestry.....	2	.....	72
Agricultural Engineering.....	.....	2	72
Rural Economics.....	1	1	36 or 72
Plant Breeding.....	1	2	36 or 108

¹ Circular 91, United States Department of Agriculture, office of Experiment Station.

NECESSARY LABORATORY SUPPLIES FOR CLASS OF TWELVE

I. Farm Mechanics and Management:—	Estimated Price.
1. *One dozen sets drawing instruments @ \$1.50	\$18.00
2. One dozen T squares @ \$.40.....	4.80
3. One blue print frame, home made.	
4. One dozen drawing boards, home made.	
5. One dozen 45° triangles.....	1.00
6. One dozen 30°-60° triangles.....	1.00
Total	\$24.80
 II. Plant Husbandry:—	
1. One dozen dissecting microscopes @ \$1.50	\$18.00
2. One dozen seed corn testers to be made by students.	
3. Two dozen tin plates for seed testers @ \$1.00	2.00
4. Propagating bed, 2' x 3', home made.	
5. Hot bed or glass house, home made.	
6. Cold frame, home made.	
7. Four dozen 3" pots @ .15.....	60
8. Four dozen 6" pots @ .25.....	1.00
9. One dozen grafting knives @ .30.....	3.60
Total	\$25.20
 III. Animal Husbandry:—	
1. Lecture room so screened as to be easily and quickly darkened.	
2. Set of animal charts, home made.	
3. Supply of score cards for the various types of farm animals, local printer.	
4. One dozen stretching boards, home made.	
5. One dozen cyanide collecting bottles, home made.	
6. Three boxes insect pins—Nos. 1, 3, 6.....	\$0.40
7. Materials for spraying solutions.....	1.00
8. Hand spray pump.....	2.50
9. Charts and Riker mounts.	
Total	\$3.90

* This set should contain a good pen and a pair of good compasses. Pupils may be required to purchase their own drawing instruments.

IV. Agricultural Chemistry and Soils:—

1. One six-bottle Babcock hand tester.....	\$9.00
2. Supply of extra glassware including skim-milk and cream bottles.....	3.00
3. One dozen 100cc. graduated cylinders @ .50	6.00
4. Box Farrington's alkaline test tablets.....	1.50
5. One set Torsion balances accurate to .01 gram with weights.....	20.00
6. One dozen common lactometers @ .50....	3.60
7. One Benkendorf's moisture test for butter..	5.00
8. One set soil sieves.....	6.00
9. Two bottles sensitive litmus paper, red and blue	40
10. Samples of various commercial fertilizers.	
11. Samples of various commercial feeds.	

Total \$54.00

The above lists comprise the minimum equipment possible for effective instruction in the several units of agriculture subjects. To this should be added at earliest possible convenience the items included in the following lists:

II. For Plant Husbandry Instruction:—

1. One compound microscope, triple objective 2/3, 1/6, 1/12, Abbe condenser, oil immersion	\$75.00
2. One graduated hypodermic syringe.....	2.50
3. One-half dozen clinical thermometers @ .75	4.50
4. Four dozen 3" Petri dishes @ \$1.80.....	7.20
5. One dozen hoes @ .40.....	4.80
6. One dozen garden rakes @ .50.....	6.00

Total \$100.00

III. For Animal Husbandry Instruction:—

1. Good lantern with abundant supply of animal slides.....	\$100.00
2. Incubator and brooder.....	20.00
3. Good barrel spray pump.....	20.00
4. Empire show cooping.....	10.00
Total	\$150.00

IV. For Chemical Instruction:—

1. Additional 6 or 8 bottle Babcock hand tester	\$9.00
2. One cream scale.....	6.00
3. One-half dozen Quevenne lactometers @ \$1.60	9.60
Total	\$24.60

Text and Reference Books.

I. Farm Mechanics and Management:—

The number following the title refers to the publisher in the list of publishers.

<i>Author</i>	<i>Title</i>	<i>List Price</i>
*Roberts	Farmers' Business Handbook (1)	\$1.25
*Roberts	The Farmstead (1).....	1.50
King	Ventilation (17).....	75
Davidson & Chase	Farm Machinery and Farm Motors (3).....	2.00
*Tracy	Introductory Course in Mechanical Drawing (4).....	1.80
*Taylor	*Agricultural Economics (1).....	1.25
*Anthony	Elements of Mechanical Drawing (8)	1.25
*Bennett	Problems in Mechanical Drawing (30)	1.20

* Suitable for texts

	<i>Author</i>	<i>Title</i>	<i>List Price</i>
II.	Plant Husbandry:—		
	*Hunt	Cereals in America (3).....	1.75
	Spillman	Farm Grasses in the United States (3)	1.00
	Shaw	Soiling Crops and the Silo (3)..	1.50
	Coburn	The Book of Alfalfa (3).....	2.00
	Wing	Alfalfa Farming in America (15)	2.00
	*Hunt	Forage and Fibre Crops in America (3).....	*1.75
	*Russell & Hastings	Agricultural Bacteriology (16)..	1.25
	*Conn	Bactria, Yeasts and Molds in the Home (2).....	1.00
	Bailey	The Forcing Book (1).....	1.25
	Waugh	The American Apple Orchard (3)	1.00
	*Duggar	Fungous Disease of Plants (2)..	2.00
	*Lyon & Montgomery	Examining and Grading Grains (2)	60
	*Bailey	Nursery Book (1).....	1.50
	*Bailey	Garden Making (1).....	1.00
	Myrick	Book of Corn (3).....	1.50
	Dondlinger	Book of Wheat (3).....	2.00
	Frazer	The Potato (3).....	75
	Bailey	Principles of Fruit Growing (1)	1.50
	Bailey	Pruning Book (1).....	1.50
	Greene	Among School Gardens (24).....	1.25
	Card	Bush Fruits (1).....	1.50
	Rawson	Success in Market Gardening (12)	1.10
	*Bailey	Principles of Vegetable Gardening (1).....	1.25
	Bennett	The Vegetable Garden (12).....	1.50
	Taft	Greenhouse Construction (3)...	1.50
	Taft	Greenhouse Management (3)....	1.50
	Bailey	Plant Breeding (1).....	1.25

* Suitable for texts.

<i>Author</i>	<i>Title</i>	<i>List Price</i>
Bennett	The Flower Garden (12).....	1.50
Maynard	Landscape Gardening (10).....	1.50
Bailey	Manual of Gardening (1).....	2.00
Lodeman	Spraying of Plants (1).....	1.25
*Stevens &		
Hall	Diseases of Economic Plants (1)	2.00
Weed	Farm Friends and Farm Foes (8)	90
Lipman	Bacteria in Relation to Country Life (1).....	1.50
*Goff	Principles of Plant Life (14)....	1.00

III. Animal Husbandry:—

Smith	Our Insect Friends and Enemies (11)	1.50
Comstock	How to Keep Bees (12).....	1.00
*Plumb	Types and Breeds of Farm Ani- mals (2).....	2.00
Punnett	Mendelism (1).....(about)	80
Davenport	Domesticated Animals and Plants (2)	1.25
Doncaster	Heredity (23).....	40
Shaw	Animal Breeding (3).....	1.50
Wing	Sheep Farming in America (15)	1.00
Roberts	The Horse (1).....	1.25
Johnstone	The Horse Book (15).....	2.00
Coburn	Swine in America (3).....	2.50
Craig	Diseases of Swine (3).....	75
Mayo	Diseases of Animals (1).....	1.50
Reynolds	Veterinary Studies (1).....	1.75
*Robinson	Poultry Craft (3).....	1.50
Valentine	How to Keep Hens for Profit (1)	1.50
Salmon	Diseases of Poultry (3).....	50
Mumford	Beef Production (29).....	1.50
Bach	How to Judge a Horse (5).....	1.00
Wilcox	Farm Animals (12).....	2.00
Shaw	Management and Feeding of Cattle (3)	2.00

* Suitable for texts.

<i>Author</i>	<i>Title</i>	<i>List Price</i>
*Decker	Cheese Making (14).....	1.75
*Brigham	Progressive Poultry Culture (28)	1.50
*Craig	Judging Live Stock (26).....	1.50
*Comstock	Insect Life (27).....	1.75
*Hawks	Science and Art of Poultry Cul- ture (22).....	2.75
IV. Agricultural Chemistry and Soils:—		
*King	The Soil (1).....	1.50
*Vivian	First Principles of Soil Fertility (3)	1.00
*Burkett	Soils (3).....	1.25
Storer	Agriculture in Some of Its Rela- tions with Chemistry, 3 vols. (6)	5.00
Warrington	Chemistry of the Farm (3).....	1.00
*Hart & Tottingham	Agricultural Chemistry (7)....	1.50
Voorhees	Fertilizers (1).....	1.25
Hall	Fertilizers and Manures (19)...	1.50
*Snyder	Soils and Fertilizers (1).....	1.25
King	Irrigation and Drainage (1)....	1.50
*Henry	Feeds and Feeding (13).....	2.25
*Jordan	Feeding of Animals (1).....	1.50
Shaw	Feeding of Farm Animals (3)...	2.00
*Farrington & Woll	Testing Milk and Its Products (14)	1.00
Wing	Milk and Its Products (1).....	1.50
Gurler	The Farm Dairy (15).....	1.00
*Lyon & Fippin	Principles of Soil Management(1)	1.75
*Russell & Hastings	Experimental Dairy Bacteriology (2)	1.00
Conn	Practical Dairy Bacteriology (3)	1.25
Lane	The Business of Dairying (3)...	1.25
*Jones	Notes on Drainage (18).....	1.10

* Suitable for texts.

<i>Author</i>	<i>Title</i>	<i>List Price</i>
*Whitson &		
Walster	Notes on Soils (20).....	90
*Elliott	Practical Farm Drainage (10)...	1.50
*Snyder	Chemistry of Plant and Animal Life (1).....	1.25

General Reference Books:—

Bailey	Principles of Agriculture (1)....	1.25
Burkett, Stevens & Hill	Agriculture for Beginners (2)...	75
Davis	Rural School Agriculture (3)....	1.00
Duggar	Agriculture for Southern Schools (1)	75
Hatch & Haselwood	Elementary Agriculture (25)....	60
Goff & Mayne	First principles of Agriculture (4)	80
Warren	Elements of Agriculture (1)....	1.10
Massey	Practical Farming (21).....	1.50
McLennan	A Manual of Practical Farming (1)	1.50
Card	Farm Management (12).....	2.00
King	The Physics of Agriculture (17)	1.75
Terry	Our Farming (3).....	1.00
Woll	Handbook for Farmers and Dairy- men (10).....	1.50
Hunt	How to Choose a Farm (1).....	1.75
Bailey	Cyclopedia of American Agricul- ture (1) 4 vols.....	20.00
Ogden	Rural Hygiene (1).....	1.50
Belcher	Clean Milk (3).....	1.00
Halligan	Fundamentals of Agriculture (8)	1.25
Wilkinson	Practical Agriculture (4).....	1.00
Wilson	Agriculture For Young Folks (9)	1.00

* Suitable for texts.

LIST OF PUBLISHERS

- (1) The Macmillan Company, New York.
- (2) Ginn & Company, Boston, Mass.
- (3) Orange Judd Company, New York.
- (4) American Book Company, New York.
- (5) W. R. Jenkins Publishing Co., New York.
- (6) Charles Scribner's Sons, New York.
- (7) E. B. Hart, Experiment Station, Madison, Wis.
- (8) D. C. Heath & Co., New York.
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- (19) E. P. Dutton & Co., New York.
- (20) H. L. Walster, Experiment Station, Madison, Wis.
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- (22) E. B. Hawks, Clinton, Wis.
- (23) G. P. Putnam's Sons, New York.
- (24) Charities Publication Committee, 105 E. Twenty-Second St., New York.
- (25) Row Peterson & Co., 378 Wabash Ave., Chicago, Ill.
- (26) Kenyon Publishing Co., Des Moines, Ia.
- (27) D. Appleton Co., Chicago, Ill.
- (28) The Torch Press, Cedar Rapids, Ia.
- (29) H. W. Mumford, Urbana, Ill.
- (30) Manual Arts Publishing Co., Peoria, Ill.

UNITED STATES DEPARTMENT OF AGRICULTURE

Farmers' Bulletins

The following selected list of Government Bulletins are recommended for school use.

I. FARM MECHANICS AND MANAGEMENT:—

- No. 32.—*Silos and Silage*.—Historical account, various types of silos and results obtained from feeding silage.
- No. 185.—*Beautifying the Home Grounds*.—Title suggests subject matter. No library should be without this bulletin.
- No. 270.—*Modern Conveniences for the Farm Home*.—The water supply, the bath, disposal of sewage, garbage and ashes, heating and ventilating with plans for arrangement of farm buildings. Should have a place in every school library.

II. PLANT HUSBANDRY:—

- No. 28.—*Weeds: And How to Kill Them*.—Title sufficiently suggestive.
- No. 52.—*The Sugar Beet*.—The culture, seed development and manufacture of beet sugar and statistics.
- No. 86.—*Thirty Poisonous Plants*.—A practical treatise on poisonous plants, illustrated, should be used by every student in botany.
- No. 121.—*Beans, Peas and Other Legumes as Food*.—A complete treatise on the nutritive value of legumes. For domestic science classes.
- No. 154.—*The Home Fruit Garden*.—Treats of its preparation and care.
- No. 156.—*The Home Vineyard*.—Its preparation and care with special reference to northern conditions.
- No. 173.—*Primer of Forestry*.—Part I. Should be in every school library and studied in every school in the state.
- No. 188.—*Weeds Used in Medicine*.—Gives a list and description of about thirty weeds used for medicinal purposes with directions for collecting and curing same. A good supplementary text for the botany classes.
- No. 195.—*Annual Flowering Plants*.—Illustrated. Methods of culture, decorative uses and plans for school and home gardens. Very helpful, good for botany classes.
- No. 204.—*The Cultivation of Mushrooms*.—The title suggests content; applied botany.

- No. 229.—*The Production of Good Seed Corn.*—Supplementary to circular No. 8 of the Wisconsin station. Should be in every school library in the state.
- No. 243.—*Fungicides and Their Use in Preventing Diseases of Fruits.*—The preparation and use of various sprays with description of fungus diseases of fruits. Good for botany classes and valuable for reference.
- No. 253.—*The Germination of Seed Corn.*—Title suggests contents, should be used to supplement circular No. 8 of the Wisconsin Station.
- No. 255.—*The Home Vegetable Garden.*—Should be used to supplement No. 218, "The School Garden."
- No. 260.—*Seed of Red Clover and Its Impurities.*—Contains illustrations of weed seeds commonly found in clover seed. A good supplementary text for botany classes.
- No. 278.—*Leguminous Crops for Green Manuring.*—Treats of the restoration of nitrogen and the improvement of soil texture through the use of legumes for green manuring.
- No. 282.—*Celery.*—History, growth, fertilizers, soil requirements, cultivation and marketing. Good for geography classes.
- No. 306.—*Dodder in Relation to Farm Seeds.*—Character and habits of the parasite with numerous illustrations. Very practical botany.
- No. 354.—*Onion Culture.*—An industry possessing possibilities for Wisconsin boys. They should read this bulletin. Good for geography classes.
- No. 358.—*Primer of Forestry.*—Part II. Supplementary to No. 173, Part I. Should be in all libraries.
- No. 368.—*The Eradication of Bindweed, or Wild Morning Glory.*—The character of the weed, its habits of growth and how to control it.

III. ANIMAL HUSBANDRY:—

- No. 51.—*Standard Varieties of Chickens.*—Nicely illustrated, 48 pages.
- No. 54.—*Some Common Birds.*—Their relation to agriculture, 40 pages, illustrated.
- No. 64.—*Ducks and Geese.*—Standard breeds and management, 55 pages, nicely illustrated.
- No. 71.—*Some Essentials in Beef Production.*—Types of good and bad beef animals illustrated.
- No. 99.—*Three Insect Enemies of Shade Trees.*—Treats of the life, history and habits of the Elm tree leaf beetle, the white maked tussock moth and the fall urb worm.

- No. 106.—*Breeds of Dairy Cattle*.—Ten breeds discussed 48 pages, nicely illustrated.
- No. 127.—*Important Insecticides*.—Direction for their preparation and use with methods of application.
- No. 137.—*The Angora Goat*.—Illustrated. For classes in geography.
- No. 155.—*How Insects Affect the Health of Rural Districts*.—Special emphasis is placed on the life history and habits of the anapholes mosquito, the carrier of the malaria germ.
- No. 165.—*Silkworm Culture*.—Life history and habits of the insect with directions for rearing it and the methods used in the production of rare silk. For classes in geography.
- No. 177.—*Squab Raising*.—Directions for raising squabs for market. A promising industry for farm boys.
- No. 200.—*Turkeys*.—Standard varieties, care, management, marketing, parasites and diseases of same.
- No. 287.—*Poultry Management*.—Title sufficiently suggestive. Illustrated, 48 pages, should have a place in every school library.

IV. AGRICULTURAL CHEMISTRY AND SOILS:—

- No. 22.—*The Feeding of Farm Animals*.—Contains a list of feeding stuffs with their digestible nutriments, standard rations and method used for their calculation, with a summary of experiments made by different stations.
- No. 44.—*Commercial Fertilizers*.—A discussion on their composition and use with directions for their application.
- No. 187.—*Drainage of Farm Lands*.—Construction of open ditches and tile drains. Kind of tiles to use, method of laying, etc.
- No. 257.—*Soil Fertility*.—An address delivered before a Maryland Farmers' Club. Good for classes in agriculture.
- No. 266.—*Management of Soils to Conserve Moisture*.—Treats of methods of handling soils during a drought or in semi-arid regions.

V. MISCELLANEOUS:—

- No. 34.—*Meats, Composition and Cooking*.—Subject matter suggested by title. Good for classes in domestic science.
- No. 63.—*Care of Milk on the Farm*.—Treats of the production of clean milk through the care of the cow, sanitary stables and milking utensils.

- No. 93.—*Sugar as Food*.—Should be used by classes in domestic science.
- No. 110.—*Rice Culture in the United States*.—For the geography class.
- No. 112.—*Bread and Bread Making*.—A splendid treatise on this important subject. Especially good for classes in domestic science.
- No. 134.—*Tree Planting on Rural School Grounds*.—Something of value for Arbor Day, should be in every school library.
- No. 179.—*Horse Shoeing*.—Discussion of proper and improper methods of shoeing horses. Boys should read this.
- No. 196.—*Usefulness of the American Toad*.—Life history and habits of the animal and its relation to agriculture. For classes in agriculture and nature study.
- No. 203.—*Canned Fruits, Preserves and Jellies*.—Principles of canning and preserving with methods of making jellies. For classes in domestic science.
- No. 206.—*Milk Fever*.—Its simple and successful treatment. Valuable for reference work in dairy regions.
- No. 218.—*The School Garden*.—Contains planting plans, directions for making experiments and list of trees and shrubs suitable for school grounds.
- No. 228.—*Forest Planting and Farm Management*.—A treatise on conservation and reforestrization.
- No. 235.—*The Preparation of Cement Concrete*.—Valuable for reference, particularly when farmers may obtain access to library.
- No. 248.—*The Lawn*.—Making and keeping the lawn. Valuable.
- No. 301.—*Home Grown Tea*.—Its history and cultivation. For classes in geography.
- No. 302.—*Sea Island Cotton*.—Its culture, improvement and diseases. For classes in geography.
- No. 356.—*Peanuts*.—An industry of considerable importance in the United States. Good for geography classes.
- No. 363.—*The Use of Milk as Food*.—Title suggests contents. Good for domestic science classes.
- No. 369.—*How to Destroy Rats*.—A very practical bulletin.

The above bulletins may be had on request to either of our United States senators or to our representatives in Congress, or by making application direct to the United States Department of Agriculture, Division of Publications, Washington, D. C.

FREE BULLETINS OF THE UNIVERSITY OF WISCONSIN AGRICULTURAL EXPERIMENT STATION**Available for School Use**

Since the demand upon the Station is constant, its store of bulletins is being continually depleted and for this reason we cannot promise to furnish all the bulletins listed below on request. In a short time many of these publications will be out of print and will not be re-issued.

SYNOPSIS**I. FARM MECHANICS AND MANAGEMENT:—**

Bulletin No. 185.—*Sanitary Cow Stalls.*—Illustrates various methods of constructing cow stalls and gives estimates of their cost. Useful to classes in arithmetic and mechanical drawing.

Bulletin No. 197.—*Methods of Paying for Milk at Cheese Factories.*—A good text for classes in farm book-keeping and dairying.

Bulletin No. 198.—*Methods of Renting Farm Lands in Wisconsin.*—Furnishes good material for farm book-keeping class.

Bulletin No. 200.—*The Selection of Feeds for Dairy Cows.*—Gives methods of computing standard rations from farm feeds.

II. PLANT HUSBANDRY:—

Bulletin No. 166.—*Disinfection and Commerical Disinfectants.*—A treatise of the spread of germ diseases. It tells how this spread may be checked by the use of disinfectants; tells what disinfectants to use and how to apply them. Everybody should be familiar with the contents of this bulletin.

Bulletin No. 168.—*Spraying Potatoes Against Blight and the Potato Beetle.*—A description of the methods and materials used in preparing sprays and how to apply them. Should be in every library in the potato region.

Bulletin No. 175.—*A Three Year Campaign Against Bovine Tuberculosis.*—A history of the fight made against tuberculosis in cattle in Wisconsin, with general observations on the spread of tuberculosis and its control by the use of the test. All schools.

Bulletin No. 176.—*The Improvement of Wisconsin Tobacco Through Seed Selection.*—Contents sufficiently suggested by title. Of interest in tobacco region.

- Bulletin No. 177.—*Potato Culture in Northern Wisconsin.*—Treats on the preparation and fertilization of the soil for this crop, and its subsequent care and management. Good for schools in potato region.
- Bulletin No. 179.—*The Eradication of Farm Weeds With Iron Sulphate.*—A treatise on the preparation of the spray, methods of and time to apply it, and the effect of its use on the weeds and the crop. Good for all schools.
- Bulletin No. 183.—*Growing Clover for Seed and Forage in Northern Wisconsin.*—Tells how to test clover seed, describes method of handling the crop, emphasizes the importance of growing clover for seed. For Northern Wisconsin schools.
- Bulletin No. 201.—*Planting and Care of the Orchard.*—Tells how to select, plant, prune and care for orchard trees.
- Bulletin No. 206.—*Tobacco Culture.*—Valuable for classes in tobacco region. Title indicates contents.
- Bulletin No. 207.—*Orchard Management.*—A discussion of the methods to be employed in order to keep an orchard at a maximum point of production.
- Bulletin No. 212.—*Barley Culture in Wisconsin.*—Gives the methods used in breeding and disseminating high grade barleys by the Wisconsin Station during the past twelve years. For the agronomy class.

III. ANIMAL HUSBANDRY:—

- Bulletin No. 184.—*Practical Swine Management.*—Finely illustrated and contents sufficiently suggested by title. For all schools.
- Bulletin No. 186.—*Suggestions for the Improvement of Wisconsin Horses.*—Title designates contents. Valuable for the class in animal husbandry.
- Bulletin No. 187.—*The University Dairy Herd.*—Giving the herd records for 1908-9. Illustrates methods of keeping herd records.
- Bulletin No. 190.—*Common Insect Pests of Orchard Fruits in Wisconsin.*—A description of the ravages of the plum curculio, the codling moth, and various other insects common in Wisconsin and the best methods of controlling them.
- Bulletin No. 191.—*A Decade of Official Tests of Dairy Cows.*—Gives milk and butter fat production of all cows tested in Wisconsin during the past ten years.
- Bulletin No. 192.—*The Dairy Calf at Meal Time.*—Tells how to feed and care for the dairy calf.

IV. AGRICULTURAL CHEMISTRY AND SOILS:—

Bulletin No. 156.—*A Simple Test for Casein in Milk and its Relation to the Dairy Industry.*—This bulletin describes the casein test, tells how the test is made and gives a list of the precautions to be observed in making the test. Good for high schools.

Bulletin No. 174.—*The Conservation of Phosphates on Wisconsin Farms.*—A treatise on soil fertility and exhaustion, with special reference to the most important element, phosphorus. Good for high schools.

Bulletin No. 180.—*Fertilizers for Wisconsin Farms.*—A good general treatise on fertilizers, analysis of commercial fertilizers sold in the state, and the text of the Wisconsin Fertilizer Law. For high schools.

Bulletin No. 194.—*Licensed Commercial Feeding Stuffs, 1909.*—Gives a list of feeds, dealers in, and chemical composition of same licensed for sale in this state.

Bulletin No. 199.—*Principles and Practice of Land Drainage.*—Title suggests contents.

Bulletin No. 200.—*The Selection of Feeds for Dairy Cows.*—Gives methods of computing standard rations from farm feeds.

Bulletin No. 202.—*The Management of Heavy Clay Soils.*—Treats of clearing, draining, tilling and fertilizing clay lands and gives satisfactory crop rotation for same.

Bulletin No. 204.—*The Improvement of Sandy Soils.*—A discussion of the best methods of handling sandy soils for increasing their fertility and water-holding capacity.

Bulletin No. 205.—*The Development of Marsh Soils.*—A discussion of the proper methods to be pursued after the water has been removed from marsh soils.

Bulletin No. 211.—*Buttermilk Cheese Making at the Creamery.*—Gives a description of a new method for making of cheese from buttermilk. For the class in dairying.

V. MISCELLANEOUS:—

Bulletin No. 196.—*Opportunities for Profitable Farming in Northern Wisconsin.*—Title sufficiently suggestive.

Bulletin No. 203.—*Report of the Director for 1910.*—Complete report of the various lines of work carried on at the Wisconsin Station.

Bulletin No. 208.—*Crop Demonstrations on State and County Farms.*—Gives an outline of the methods used to show the effect of proper seed, selection, curing and testing, crop rotations and soil treatment. A splendid guide for the teacher to use in connection with experimental work on school plat.



Bulletin No. 209.—*Factors Influencing Prices of Farm Products.*—Shows effect of supply and demand on price of staples. Also effect of storing perishable products on prices of same.

Bulletin No. 210.—*The Dairy Industry in Wisconsin.*—Shows extent and distribution of condensaries, creameries and cheese factories in this state.

Circulars of Information

Brief treatises on a single topic; hence content is sufficiently suggested by the title. Should be used by all classes in agriculture.

I. FARM MECHANICS AND MANAGEMENT:—

No. 5.—*The Hollow Concrete Fence Post.*

II. PLANT HUSBANDRY:—

No. 8.—*Corn Judging.*

No. 12.—*Spraying the Home Orchard.*

No. 16.—*The Culture and Storage of Root Crops.*

No. 18.—*The Curing and Testing of Seed Corn.*

No. 19.—*The Control of Quack Grass and Canada Thistles.*

No. 23.—*A Catechism on Bovine Tuberculosis.*

III. ANIMAL HUSBANDRY:—

No. 9.—*The Wisconsin Dairy Cow Competition.*

No. 13.—*The Care of New Born Foals.*

No. 17.—*Draft Horse Judging.*

IV.—AGRICULTURAL CHEMISTRY AND SOILS:—

No. 6.—*Synopsis of Wisconsin Drainage Laws with Forms and General Suggestions.*

No. 11.—*Concentrated Feeding Stuffs and Fertilizers Licensed for Sale in Wisconsin in 1910.*

No. 22.—*Licensed Commercial Feeding Stuffs.*

No. 24.—*Feeds Licensed for Sale, 1911.*

No. 27.—*The Babcock Test and How to Use it.*

V. MISCELLANEOUS:—

No. 7.—*The Agricultural Extension Service.*

BIBLIOGRAPHY

Prepared by the United States Bureau of Education

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General

- American association of farmers' institute workers. *Proceedings of the thirteenth annual meeting*, held at Washington, D. C., November 16-17, 1908. Washington, Government printing office, 1909. 73 p. 8°. (United States Department of Agriculture, Bulletin 213.)
- Association of American agricultural colleges and experiment stations. *Committees on methods of teaching agriculture. Secondary courses in agriculture.* (Washington, Government printing office, 1902). 10 p. 8°. (United States Department of Agriculture, Circular No. 49.)
- Bailey, Liberty Hyde. *The training of farmers.* New York, the Century Co., 1909. 263 p. 12°.
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