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Helps for Teachers of Agriculture January-April

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INTRODUCTION.

Do not fail to read pages 1 to 6 inclusive. They contain important information and suggestions.

If you did not receive copies of the September-October and November-December issues of "Helps for Teachers of Agriculture", please notify your county superintendent. A supply of the bulletins was sent to him.

This bulletin covers four months' work instead of only two months.

As stated in the September-October number, you are not expected to do all of the work outlined. You are to take up only the subject which your county superintendent selected for your county.

The outlines for work in "Soils" and "Poultry" were prepared by the undersigned. Mr. J. D. Harper, and Mr. F. M. Shanklin, Purdue Extension Department, prepared the outlines on "Horticulture and Dairying", and "Animal Husbandry and Farm Groups", respectively.

Z. M. SMITH,
Deputy Superintendent in Charge of Agricultural
Education and Club Work.

Read carefully pages 1 to 6 inclusive.

CLUB WORK.

In our suggested helps for teachers we have emphasized the importance of home projects as a part of the school work in agriculture and domestic science. Definite plans should be made during the months of January and February for carrying out home projects during the summer. The names of the boys and girls who are planning to do this work should be secured and the kind of project or projects should be determined. The names of the boys and girls who enroll should be sent to the county superintendent and to Z. M. Smith, State Supervisor of Agricultural Education, Lafayette, Indiana. Blanks for reporting names are in the back of this bulletin. More will be supplied upon request to Z. M. Smith, Lafayette, Indiana.

The project selected may be pig or poultry raising, corn or potato growing, gardening and canning, or market gardening.

School Credit for Club Work.

The teacher and the county superintendent should require this kind of work and should give school credit for it when thoroughly done. The children should not be induced to undertake these projects for the sake of winning a premium. The schools should give credit for written accounts of how the work was done and for certified records of things accomplished. Parents should give suitable rewards for work of this kind.

Basis of Credits.

The county superintendent and his Board of Education should determine the basis on which credits are to be given. In some counties eighth grade pupils are required to do a specific piece of work outside of their regular school duties. This special work might well be a project relating to the growing of crops or the raising of livestock instead of writing an essay, delivering an oration, or drawing a map. Seventh grade pupils, and high school pupils below the fourth year, who have the agricultural work, might be required to complete a project at home during the summer, credits for the year's work being withheld until satisfactory reports on the summer's work have been received. It might be advisable to give credit toward advanced standing

for club work in case the work is closely supervised and inspected day after day by a competent supervisor employed for the purpose.

Items that should be considered in determining the final per cent grade earned by a pupil are as follows:

I. Project—Corn Growing—	
Production cost per bushel	30
Profit on the Investment	30
Exhibit of ten ears	20
A written account of how the work was done	20
II. Project—Potato Growing—	
Production cost per bushel	30
Profit on the investment	30
Exhibit of one peck of potatoes	20
A written account of how the work was done	20
III. Project—Pig Raising—	
Production cost per pound	30
Net gain in pounds from ten weeks to six months of age (two pigs)	35
Written account of how the work was done	15
Daily detailed records of weights, feeds, gains, etc	20
IV. Project—Poultry Raising—	
Production cost per pound	30
Number of chickens hatched from 15 eggs and living at end of four months	35
Daily detailed records of weights, feeds, gains, etc	20
Written account of how the work was done	15
V. Project—Gardening and Canning—	
Profit on investment	20
Written account of how the work was done	20
Variety of canned products	20
Number of quarts canned	20
Daily detailed records of amount produced, amount sold, amount canned, amount used fresh, etc	20
VI. Project—Market Gardening.	
Profit on investment	30
Written account of how the work was done	20
Detailed records of amount produced, amount sold, amount used at home, etc	20
Exhibit of products	30

Community Interest.

The parents of the children, the township trustees, farmers' institute workers, ministers, bankers, and merchants should cooperate heartily with the schools by giving encouragement to the children and by assisting in organizing and supervising the work.

The pre-vocational agricultural and domestic science work which is required by law will not serve its purpose unless it be done in such a manner as to cause the pupils to react to the stimulus of the classroom instruction by the actual doing of practical things on the farm and in the home. The school exercises in agriculture and domestic science should deal directly and in a practical way with the work of the homes and the farms in the community.

Enrollment.

Club work need not be limited to pupils in the classes in agriculture. Every boy or girl between the ages of ten and eighteen years inclusive should be encouraged to take up the work. Use the blanks in the back of this bulletin for reporting names to the county superintendent, and to Z. M. Smith, Purdue Extension Department, Lafayette, Indiana. Printed helps will be sent to the children whose names are reported.

Supervision.

Adequate provision should be made for proper supervision of the work during the summer. If it is impossible to employ a supervisor, a committee of three or five men and women for each school district should personally supervise the children in their work.

It is probable that in some cases the county board of education could secure financial assistance toward the employment of a township supervisor. For information in regard to this matter address Z. M. Smith, Lafayette, Indiana.

Please read carefully pages 1 to 6.

SOILS.

January, 1915.

Fertility of Soils and Subsoils.

1. Material and Equipment—

- 1 qt. of clay soil and 1 qt. of subsoil.
- 1 qt. of loam soil and 1 qt. of subsoil.
- 1 qt. of sandy soil and 1 qt. of subsoil.
- 6 tomato cans.

2. Demonstration Exercises—

- 1. Plant beans in 1 qt. of clay and 1 qt. of subsoil.
- 2. Plant beans in 1 qt. of loam and 1 qt. of subsoil.
- 3. Plant beans in 1 qt. of sand and 1 qt. of subsoil.
- 4. Go into the field and study characteristics of soil and subsoil to a depth of two or three feet.

3. Questions—

- Why is subsoil not as fertile as soil?
- Should large quantities of subsoil be turned up by the plow at any one time?
- Why is this so?
- What is the effect of the character of subsoil on drainage?

February, 1915.

Effect of Mulch in Preventing Evaporation.

1. Material and Equipment—

- 1/2 gal. loam soil.
- 2 flower pots.
- Clover or alfalfa seed.
- 2 1/2 gal. buckets, or 6 tomato cans.
- Clay, loam and sandy soils.
- Pair of scales weighing to lg.

2. Demonstration Exercises—

- 1. Fill two flower pots with loam soil and plant seeds in each. Do not cover the flower pots. Keep the soil in each pot in proper moisture condition for the germination of seeds and the growth of plants. Be sure to put equal amounts of water in each pot. After the plants have obtained a growth of about two inches, cover the soil in one pot with a one-inch layer of dust. Place the

pots in a window and note which plants first show the need of water.

2. Fill half-gallon buckets or tomato cans with soil, two with loam, two with clay and two with sand. Saturate with water the soil in each container. Weigh container and soil. After the top soil has become dry enough to be worked, stir to the depth of one inch. Weigh container and soil. Cover one sample of loam, one of sand, and one of clay with dust to the depth of one inch. Every twenty-four hours, for 10 to 14 days, weigh the samples covered with dust and those not covered. Record weights. Which loses the greatest amount of moisture? As soon as the soil is ready to be worked in the spring the pupils should try out on the farms the value of a dust mulch.

3. Questions—

Explain the meaning of a soil mulch. What is a "dust mulch"? What is the proper depth for a soil mulch? How often should a soil mulch be renewed? Why should soil be cultivated after a rain? Methods of producing a "dust mulch." Other soil mulches.

March, 1915.

Working Soil when too Wet.

1. Material and Equipment—

One pt. each of clay, loam and sandy soil.
Pour tin pie pans.

2. Demonstration Exercises—

1. Stir enough water in a half pint of clay to make a thick paste. To another sample add just enough water to make the soil crumble nicely when handled. Dry both in the sun or by the fire. When dry which can be pulverized most easily?
2. Mix thoroughly equal amounts of clay and sand. Make a thick paste out of one sample. Wet another sample just enough to make the soil crumble nicely. Which can be pulverized most easily when dry? Compare samples made of clay and sand with samples having only clay.
3. Repeat the exercises, using clay and loam.
4. Experiment with small plats in fields and gardens.

3. Questions—

Why should soils not be worked when wet? How and why do soils puddle? Which is damaged most by cultivation when wet, clay, sandy clay or clay loam? How to improve naturally wet soils.

April, 1915.

Aeration, of Soils.

1. Material and Equipment—

2 tomato cans.
2 1-qt. Mason jars.
Clay and loam soil.
Radish, clover or turnip seeds.
2 deep cigar boxes.

2. Demonstration Exercises—

1. Plant seeds one inch deep in puddled clay soil and in good loam soil in good condition to work. In which do seeds germinate and plants grow the better?
2. Plant seed in loam soil in Mason jars. Keep one jar tightly sealed, and leave the other uncovered. Note results in germination of seeds and growth of plants.
3. Fill with clay soil to within an inch of the top a tomato can with small holes in the bottom. Fill another with loam. Weigh separately. Saturate each sample with water. As soon as water ceases dripping from the bottom of cans, weigh again. Which retained the greater amount of water? Which will contain most air?
4. Plant seeds in loam soil in a tomato can with perforated bottom. Plant seeds in loam soil in a tomato can without perforations. When adding water from time to time put equal amounts in each can. What are the results in germination of seeds and growth of plants?

3. Questions—

Why do plant roots need air?
What effect on soil bacteria has the presence or absence of air in the soil?
Amount of air space in soils?
Effect of the excess of water on the admission of air to the soil.
How to secure proper aeration.

POULTRY.**January, 1915.***Age, Sex and Vigor.*

1. Material and Equipment—
 - An old hen and a young hen.
 - An old male bird and a young one.
 - (Pictures, if not live birds).

2. Demonstration Exercises—
 - Study birds for indication of age.
 - External indications of strength and vigor.
 - Comparison of male and female, of old and young with respect to vigor.

3. Questions—
 - What influence has age, sex, and vigor upon disease?
 - The relative value of old and young.
 - What influence has age and vigor upon reproduction?
 - What influence has age and vigor upon egg production?
 - Explain external indications of age and vigor.
 - Importance of keeping none but strong, vigorous chickens.

February, 1915.*Physical Characteristics of an Egg.*

1. Material and Equipment—
 - Raw egg.
 - Two boiled eggs.
 - Charts or drawings.
 - Hand lens.
 - Saucer.

2. Demonstration Exercises—
 - Study parts of raw eggs.
 - Study boiled egg cut transversely.
 - Study boiled egg cut lengthwise.

3. Questions—
 - What are the different parts of an egg?
 - What are fertile eggs?
 - Infertile eggs?
 - What are their keeping qualities and market value.
 - Care of eggs intended for market.
 - Points in judging eggs.

March, 1915.*Artificial Incubation.*

1. Material and Equipment—
 - Incubator (loaned by local firm).
 - Brooder (loaned by local firm).

2. Demonstration Exercises—
 - Study of the incubator.
 - Study of brooder.

3. Questions—
 - What are the advantages and disadvantages of each natural incubation? Of artificial incubation?
 - What are the methods of handling each?
 - Similarity between natural and artificial incubation.
 - Study brooder in the same manner.
 - Emphasize importance of poultry Club work.
 - (a) Interests children in home work.
 - (b) Connects school work with home life.
 - (c) Improves poultry conditions and is therefore of economical importance.
 - Keep record of number of eggs set, number hatched, number of unbroken eggs not hatched, cost of rearing chicks until four months old.

April, 1915.*Feeding Chicks.*

1. Material and Equipment—
 - Feeding troughs.
 - Water vessels.
 - Samples of feeds.

2. Demonstration Exercises—
 - Study brooders, troughs, feeds, rations, etc.

3. Questions—
 - What are the best methods of handling natural and artificial brooders?
 - What are good rations?
 - What are diseases to be avoided?
 - How prevent diseases?
 - Remedies for diseases?
 - Keep records of kinds and amounts of feeds used.
 - Weight of chicken at, end of four months.
 - Emphasize poultry Clubs and practical work at home.

DAIRYING.**January, 1915.***Testing Milk.*

1. Material and Equipment—

Milk tester, bottles, acid hot water, and whole milk.

2. Demonstration Exercises—

Test samples of milk for butter fat in tester.

3. Discussion—

Give a survey of methods and brief history of the Babcock test. Explain each step in making test. Show the necessity of thorough mixing of sample and how variations may occur. Discuss acid and hot water. Have each member of class bring composite sample of morning and evening milkings of individual cows for testing. Keep weight of each milking and figure amount of butter fat cow produces in one day.

References:

Circular No. 42, Purdue University, Lafayette. Ind. Testing Milk, Wing.

February, 1915.*Cream Separator.*

1. Material and Equipment—

Cream separator, if one can be secured.

2. Demonstration Exercises—

Separation of cream from quantity of whole milk.

3. Discussion—

Review separation methods and relative merits of each. Explain principle of centrifugal machines and show how variations may occur. Discuss speed, and regularity in connection with variations. Test milk before separation and cream afterward for butter fat.

References:

Milk and Its Products, Wing, Chapter IX.

Bulletin No. 150, Purdue University, Lafayette, Indiana.

March, 1915.*Uses of Milk.*

1. Material and Equipment—
 - 1/2 gal. Mason jar.
 - 1 pt. cream
 - 1 qt. sour milk.
 - 1/2 gal. porcelain kettle.
 - Burner or heat of some kind.
2. Demonstration Exercises—
 - Make butter by shaking cream in jar. Make cottage cheese.
3. Discussion—
 - Discuss all known uses of milk. Explain principles of butter and cheese facts themselves at home. Visit a creamery or milk plant if possible.

Reference:

Milk and Its Products, Wing, Chapters X-XV (inclusive).

April, 1915.*Feeds for Dairy Cattle.*

1. Material and Equipment—
 - Samples of good rations for dairy cow obtained in the community.
2. Demonstration Exercises—
 - Weigh out a ration and calculate the cost at prevailing prices of feeds.
3. Discussion—
 - Explain the kinds of feeds required by the dairy cow. Show necessity of having cows that elaborate feed profitably. Give method of testing a home herd to be done by the pupils. Cost of keeping a dairy cow for a year, using one of the proposed rations. Quantity of milk that should be produced by the cow, and amount of butter required to pay the cost of keeping cow. Show how to determine profit or loss by accurate accounts of feed and milk done by the class at home with their own cows and feeds.

References:

Bulletin No. 21, Purdue University, Lafayette, Indiana.
 Milk and Its Products, Wing.
 Feeds and Feeding, Henry, Chapter XXIV.

HORTICULTURE.**January, 1915.**(a) *Bordeaux Mixture.*

1. Material and Equipment—

- 1 heaping teaspoon copper sulphate.
- 2 rounding tablespoons hydrated lime.
- 1 gallon water.
- 1 cheese-cloth strainer.
- 3 wooden buckets or containers.
- 1 teaspoon container.
- 1 tablespoon container.

2. Demonstration Exercises—

Measure out one heaping tablespoon copper sulphate and one and one-half rounding tablespoons of stone lime. Dissolve the copper sulphate and wet the lime. Dilute both to half gallon and mix simultaneously by pouring at once through the cheese-cloth container.

3. Discussion—

Give a brief history of Bordeaux, noting its extensive use in the vineyards of Europe when first discovered. What is the accepted formula for Bordeaux? What is Bordeaux generally used for? Explain that this material should be made as used. The sky blue precipitate is the Bordeaux which is held in suspension as a solid and should be constantly stirred as it is applied.

Always mix the materials in dilute form.

References:

- Leaflet 39, Purdue University, Lafayette, Ind.
- Diseases of Economic Plants, Stevens and Hall.
- Principles of Fruit Growing, Bailey p. 371.

(b) *Self-Boiled Lime-Sulphur.*

1. Material and Equipment—

- $\frac{1}{4}$ pint of broken stone lime.
- $\frac{1}{4}$ pint sulphur.
- 2 gallons of water.
- 2 one-pint Mason jars.
- 1 small wire sieve.
- 2 large wooden buckets.

2. Demonstration Exercises—

Start the 1/4 pint of lime to slaking in the bucket. Just as soon as the slaking starts sift in the 1/4 pint of sulphur. Allow the slaking lime to bubble and boil the two ingredients together for about 10 minutes and then stop the slaking by the addition of water. Dilute to two gallons and then strain into an extra container. Be sure to work all the free sulphur through the strainer, as it is the material which exerts the fungicidal action.

3. Discussion—

Give the accepted formula of self-boiled lime-sulphur and explain what it is used for.

This material will not keep and, like the Bordeaux, should be thrown away if not used at once. Fresh mixtures are to be made in quantity and some peach or plum trees should be sprayed in the early summer, if possible.

Are Bordeaux and self-boiled lime-sulphur complete sprays as they are here made? What is lacking? Why is an arsenate added to all summer sprays? Why are these sprays ineffectual during the month of January? Give the comparative costs of each? If possible the class should be taken to a home orchard when spray mixtures are being prepared.

References:

Leaflet 43, Purdue University, Lafayette, Ind.

Diseases of Economic Plants, Stevens and Hall, pp. 37-39.

Note—The formula given in the Purdue Leaflet should be followed rather than those in the reference books.

February, 1915.*Spraying.*

1. Material and Equipment—

An orchard.

Spraying outfit, barrel and spray pump will do.

Several gallons of lime-sulphur in February.

2. Demonstration Exercises—

Get a spraying outfit from some farmer in the community or from some dealer and spray a tree that stands conveniently near.

Give demonstrations showing methods of handling the extension rod and pressure necessary for best results.

The pupils should do this work under the teachers' direction. Several trees should be left unsprayed as checks and counts should be made of infested areas later to show the effectiveness of spraying. These points should be explained to pupils.

References:

Leaflets, 38, 39, 43, 48, Purdue University, Lafayette, Indiana.
Injurious Insects. O. Kane. Chapters XX and XXL

March, 1915.

Priming.

1. Material and Equipment—

- 2 or 3 small apple, peach or cherry trees.
- An orchard.
- 1 pair hand pruning shears.
- 1 saw.
- 1 pole shear if possible to obtain.

2. Demonstration Exercises—

- Prune nursery trees as for planting.
- Explain how to head a tree, what limbs to take out and why.
- Make proper and improper cuts.

3. Discussion—

Discuss relative time of pruning, objects, what wood to remove, method of making cuts and protection of cuts.

Give reasons for removing limbs on seedlings as they are removed in the demonstration.

Why is pruning generally done in late winter and early spring?

How are cuts made in pruning? Does a good pruner leave stubs? Give the bad results from such pruning? What are wounds protected with? What are the objects of pruning? Show how this may be related to home work by going into a home orchard with the class and with the owner to do some pruning.

References:

The Pruning Book, Bailey. Assign such parts as apply to your conditions.

April, 1915.*Tree Planting.*

1. Material—Equipment—

Trees for Arbor Day Planting (fruit trees preferred).

Spades.

Pruning shears.

2. Demonstration Exercises—

Prune top of tree to correspond with root area.

Remove interfering branches, branches which make bad crotches, diseased branches and weak branches.

Select three or four branches from the scaffold limbs and shorten them to about one-half their length. Cut roots to healthy wood. Make cuts slant so that soil will pack around the wounded ends. See that hole is deep enough and large enough to accommodate the roots. See that the soil is in contact with every root and that it is compacted as the hole is filled. Pour water in the hole when the soil is about half in, leave the last few shovelful loose to serve as a dust mulch around the tree. Do not water the tree except in extremely dry weather.

3. Discussion—

The trees for this exercise will probably be donated.

Explain reasons for each of the points brought out in the demonstration exercises.

Why should the top be reduced?

Why not put fertilizer in hole with tree?

What kind of a tree should be planted and what economic use will it have ?

Use mulch of dry dirt after the tree is planted. The tree should be wrapped with a screen wire or tar paper to protect it from rodents during the winter. This should be removed in the spring. Give some further points of value of tree planting as a public-spirited act.

Plant trees on school grounds.

References:

The Principles of Fruit Growing, Bailey, Chap. V.

The Pruning Book, Bailey, Chap. V.

ANIMAL HUSBANDRY.**January, 1915.***Study of Breeds, Their Characteristics and Origin and Feeding Horses.*

Material and Equipment—

1. Have pupils prepare a list of the breeds represented by the horses in the community, either pure-bred or grades.
2. The history of the different breeds as given by Plumb or Harper.
3. Pictures and cuts of horses of different breeds.
4. A few animals should be accessible to the class for laboratory work.

Demonstration Exercises—

1. Have a computation made of the proportion and quantities of different feeds that would be fed to a working horse of 1800 pounds weight for a period of one month.
2. Have a similar exercise for a brood mare with colt at her side, a colt at weaning time, an idle horse, a driving horse working two days per week.
3. Keep the records as suggested in the Course of Study.

References:

- Plumb: "Beginnings in Animal Husbandry." "Types and Breeds of Farm Animals."
 Harper: Manual of Farm Animals." Ch. 4. "Animal Husbandry for Schools."
 Henry: "Feeds and Feeding." F. B. No. 346.

Some reasons should be given for the prevalence of one breed in the community. The topography, the character of the soil, the type of farming, the kind of roads may influence this choice or it may be only the influence of certain breeders.

Use the pictures as the origin of the breeds is developed. Give special attention to the breeds in the neighborhood and make the pupils familiar with the distinguishing characteristics of these breeds.

After the list of feeds common in the community is discussed, additions to the list may be suggested, giving reasons why they

should or should not be given a trial. Work out the nutritive ratio of corn and timothy hay in definite quantities and compare with the balanced ration as described in F. B. 346.

February, 1915.

Feeding Cattle.

Material and Equipment—

1. As in January, have a list of the breeds of cattle that are kept in the community, both beef and dairy cattle.
2. Pictures and cuts as before.

Demonstration Exercises—

1. Compute best ration for a yearling steer, a three-year-old steer, a milk cow, etc.
2. Compute the daily gains made by a calf fed skim milk, whole milk, running with dam, getting figures from the work that may be going on at home or in the experience of the class. Try to get some experiments started along this line.
3. Show by assumed conditions that protein feed may be supplied more economically in the form of oil meal or cottonseed meal under some conditions while again clover hay or alfalfa should supply protein. The ration should be ideal only as it fits the situation.

References:

Same as in January with
Purdue Bulletins 167, 163, 153 and other Steer Feeding Bulletins.

More cattle should be fed in almost every community for the benefit of the soil and the profit resulting. Keeping this in mind, try to bring the subject of cattle feeding before the class in a way that will make them see this need. Market demands and market quotations with a diminishing supply of cattle show the need of more cattle as well as the profit in cattle. Gains are influenced by pasturing cattle, age of cattle, followed by hogs, short vs. long feed, skill of feeder, etc. The teacher can be of much help to the community along this line if he studies the situation. The Purdue bulletins on Steer Feeding are the results of feeding along practical lines and should be studied carefully.

March, 1915.

Scoring Swine and Sheep.

Material and Equipment—

1. Score cards for swine and sheep.
2. Some representative animals of different breeds, if possible, for the class to work upon.
3. Pictures as before.

Demonstration Exercises—

1. Score as many sheep and hogs as the class can get time to do. Usually the hogs should have greater emphasis since they outnumber the sheep.
2. A pig club composed of members of the class and others might result from a little encouragement from the teacher. The club work would supplement nicely the class work and afford the best laboratory possible.

References:

Purdue Bul. No. 29.

The books by Plumb and Harper already listed may be used if accessible.

The lard type of hogs is most common in Indiana. Learn the differences between the lard and bacon types, also the names of the breeds in these classes. What breed is most numerous in your community? The highest finish in feeding hogs has not usually come from farmers. The ration has not been studied by them sufficiently and the conditions have not been good. A better finish would bring a better price and probably greater profit. The cholera fear has also made farmers afraid to keep their hogs any longer than possible. Develop the ideal of a fat hog or sheep from the score card.

The two types of sheep are Fine-wool and Mutton. Learn the breeds that belong to each. Certain breeds like the Shropshire are sometimes called dual purpose in that they serve both for wool and mutton with good returns in each. Not anywhere near enough sheep are kept on Indiana farms. Note the useful purposes they serve. Discuss the danger from dogs and show that the advantage of a whole community is greater than the individual.

April, 1915.

Feeding Swine and Sheep.

Material and Equipment—

1. Several rations that meet the requirements in fattening hogs and sheep. Also the list of feeds from which rations may be made.

Demonstration Exercises—

1. Work out problems as before, showing gains when fed different rations, suggested by class.
2. Work out a satisfactory ration for a growing pig. Note how far this comes from being the actual ration in most cases. Will pigs growing with insufficient protein in their ration be as able to resist disease as where the matter is given proper attention?
3. It may be easy to get some boys to try some experiments in feeding pigs as home project work.

References:

F. B. No. 22.

Day: "Productive Swine Husbandry."

Purdue Bul. No. 13.

The general advantages of feeding hogs are in furnishing a higher market for the feed of the farm, particularly the corn. Compare the hog with other animals in economy of gains. Iowa has nearly twice as many hogs as Indiana. Corn has been so common that it has been fed too exclusively both for economy of gains and the disease-resisting power of the hogs. Study the advantages of clover pasture or other forage crops for hogs.

The hot-house lamb is worthy of special study as the most profitable sort of feeding due to the great efficiency of the young lamb in making gains. Sheep feeding, however, may become more general as an industry.

CROPS.**January, 1915.****Cowpeas and Soy Beans.**

Material and Equipment—

1. A few specimens of these plants should be collected for class use if accessible. They may be taken from some hay in the neighborhood possibly.
2. Interest will be increased by getting from dealers in seeds as many varieties of the seed of both cowpeas and soy beans as possible. Collect in glass bottles so they may be seen without handling.

Demonstration Exercises—

1. Study dry specimens.

References:

- Purdue Extension Bul. No. 2.
 Wilson and Warburton: Field Crops, pp. 391-400.
 Purdue Ext. Bul. No. 30; F. B. No. 197.

The cowpea has been raised in the Southern States for some time but is not very well known as yet in Indiana. Both cowpeas and soy beans have come into much prominence in the last few years since there has been so much trouble in getting other legumes, particularly the clover upon which the farmer had depended. It is important that when clover fails another legume should take its place. These crops are worth special study. They may be used for seed crops, forage and hay crops and soiling crops. They have also considerable range of adaptability of soil. You will note that soy beans will grow upon almost any good corn soil but that cowpeas do best upon a sandy loam.

Note the seedbed is about the same as for corn and either fall or spring plowing is practiced. The soil should be limed for soy beans especially, but the cowpeas will grow upon slightly acid soil.

The time of sowing and quantity of seed will depend upon the purpose of the crop. If the crop is to be harvested for seed or is to be used for hay the seeds should be sown as early as May 15 to June 1. When used as a soiling crop the seed may be sown as late as July 15—thirty pounds of seed for rows 24 inches to 32 inches apart and about 60 pounds where drilled solid. The latter case is when the crop is for hay or soiling.

Inoculation is necessary for the same reason as in the case of alfalfa. The bacteria used by these crops as nitrogen-fixers

are different bacteria than are used by the clover plant and so must be introduced into the soil. One bushel of soil is sufficient for eight times that quantity of seed where the soil is distributed with the seed in the drill.

The varieties of cowpeas usually grown in Indiana are Whip-poorwill, New Era, Michigan Favorite and Early Blackeye. The varieties of soybeans most common are Early Brown and Ito San in the northern part and Holly Brook, Sable, Mikado, Black Beauty and Medium Green for the remainder of the State. The last named shatters easily, a rather common fault of many varieties. The seed used should be Indiana grown if possible, and in general should be raised to the north of us rather than south, in order that early maturing qualities may be maintained.

A leaf disease often results from cultivation of these plants in the early morning before the dew has evaporated.

February, 1915.

Oats.

Material and Equipment—

1. As many varieties as possible should be secured from dealers or others.
2. Blotting paper and plates or some other arrangement for germination.

Demonstration Exercises—

1. Hull some of each variety and note the different weights and thicknesses of the hulls.
2. Make germination tests, counting the grains and taking careful notes on all the work.

References:

- Purdue Press Bulletin 188.
 Purdue Ex. Bul. No. 30.
 Wilson and Warburton: Field Crops, pp. 174-212.
 F. B. 424.

The oats crop in Indiana has about the same acreage as wheat but ranks below that crop usually in value. It is very important to our fanners because of the ready adaptability of oats to the corn belt rotation. It requires little attention and will grow on nearly all varieties of soil, although it does best on the heavier types of soil. There is great variety of yield, ranging from a few bushels to 60 and 70 bushels; and even 150 to 200 bushels per acre have been recorded in the Rocky Mountain States. In

Indiana the yield will improve with a little more care taken in "getting in" the crop or particularly in preparing a seed bed. Where the seed is sown upon the snow in February or thrown broadcast over the hard ground without any disking before the sowing, the farmer is depending upon favorable rains to do his work for him. If the rains come in season, he often gets a good crop, but again he often fails to get a crop when he could have one with a little more work. This does not mean that the ground should be plowed, for generally the disk harrow will get the ground in good shape. In dry seasons it pays to drill, but of course one can not tell whether a season will be dry at oat seeding time.

The oats should be seeded as early as the ground can be prepared, since cool, moist weather is best for their growth. Fanners vary much in the quantity of seed used, but in general 2 1/2 bushels per acre will be found about right. Compare the stooling habits of wheat with oats and the seed sown. The varieties that seem to do best in Indiana are the Big Four, Silver Mine, Napoleon, Great Dakota. These are spring varieties. The winter varieties grown in the Southern States are usually gray or black. There is a marked preference in the market for white oats. Some attention can be paid to the smut in oats if there is time. Find out what the disease is, and the treatment, from Purdue Cir. 22.

March, 1915.

Potatoes.

Material and Equipment—

1. Secure a few potatoes from each home and get as many known varieties as possible.

Demonstration Exercises—

1. Group the varieties into Early and Late.
2. Study the form, size, character of the skin and texture.
3. Study buds (eyes) and note number and depth. Have some pupils try experimental plats to report in the fall. Have whole potatoes, small potatoes, thin put tings, etc., tried in these plats.

References:

- Purdue Extension Bulletins 20 and 30.
 F. B. 35, 91, 295, 342, 386 and 407.
 Wilson and Warburton: Field Crops, pp. 422-444.

Potatoes are native to Peru and Chili, where the Spaniards found them growing. It was introduced into Ireland in 1586 and soon became so important an article of food that the common name "Irish" was applied.

It is fairly well known that a well-drained sandy loam well supplied with organic matter is best adapted to potatoes. Yet a fair return can usually be had on a considerable variety of soils. Note the method described in Ext. Bul. 30 for planting the crop. Deep ploughing and a five or six-inch furrow with the seed planted about two inches is recommended. Medium sized potatoes are the desirable ones and hence the seed should be of that size.

Early varieties such as Early Ohio, Early Rose, Irish Cobbler should be planted usually before April 15. The late varieties represented by Rural New Yorker, Sir Walter Raleigh, Carman and Burbank are planted by May 15 and sometimes later.

Notice the general instructions for destroying the potato bug. A mixture of Bordeaux mixture and Paris Green will serve as a spray that will kill the two most common insects that infest our potatoes. Purdue Leaflet No. 29 tells you how to make Bordeaux mixture.

April, 1915.

Corn Cultivation.

Material and Equipment—

1. A few of the tools, particularly the two-horse cultivator, in common use in cultivating corn.

Demonstration Exercises—

1. Make a study of the adjustments for deep and shallow cultivation. Study also the two-row cultivator.
2. Study the two purposes of cultivation and make out a plan that will serve this end. See if implements are the best possible.

References:

Purdue Bul. No. 110.

Purdue Cir. No. 25.

Wilson and Warburton: Field Crops, pp. 76-81.

The study of agriculture has done much to change the plan of corn cultivation. It is no longer so common to go into the cloddy field just as the corn is getting through and try to plow the corn. The clods if they exist at that stage should be rolled

and the spike-tooth harrow applied until the corn is two or three inches high, when the cultivator will be much easier to use.

Note the two uses for cultivating corn. Of these the conservation of moisture needs most emphasis. We usually try to keep the weeds from "choking down" the corn, another way of saying that the weeds are consuming the plant food intended for the corn, but it is not so certain that we keep the crust broken and a good dust mulch on top. The past two seasons in Indiana have done much to give our farmers training in the uses of the dust mulch in conserving moisture. We are sometimes told that a third purpose of cultivation is aeration of the soil, but this does not cause any change from the two given.

Shallow cultivation has finally won all farmers to its practice. The roots of the corn gradually occupy about all the space between the rows and the later plowings will do much harm unless the farmer keeps on top of the ground or nearly so. The season may require very frequent workings of some sort to keep the weeds down or the mulch prepared, or a dry season will need but a few plowings or workings, hence there is little to be said about how many times the corn should be plowed.

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 And
 The State Department of Public Instruction.

CLUB WORK.

Send this sheet, after the enrollment has been completed, to Z. M Smith, LaFayette, Indiana.

Kinds of Projects.

- | | |
|---------------------------|---------------------|
| 1. Corn Growing. | 2. Potato Growing |
| 3. Pig Raising. | 4. Poultry Raising. |
| 5. Gardening and Canning. | 6. Market Gardening |

Name of organizerAddress..... Date.....

Name	Age	P.O.	County	Kind of Project

For additional names, use blank sheets. Give full information.

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