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THE USE OF THE CLASS PERIOD

Do teachers of agriculture make the best possible use of the time spent with their classes? Other teachers are asking the same question about their time. There is reason for doubt on this point.

The following brief sketch illustrates the kind of procedure frequently found in agriculture classrooms. We will assume that certain reading material has been assigned and that eighty per cent of the boys have studied the assignment. The problem to be discussed is "How can the horse labor on my farm be done more economically?"

After the problem has been stated, the teacher begins a question and answer process as follows:

Teacher: How many hours per day averaged over a year's time does a farm work horse work?

Jchn: Between three and five hours.

Teacher: How may the average number of hours of a given farm be increased, James?

James: One way is to select enterprises which will distribute horse labor evenly through the year. Horses then work steadily through the year and perhaps fewer horses can do the necessary work.

The teacher then asks for other ways of increasing the average number of hours per day. Then the teacher brings up for discussion such questions as "How can horse labor be saved," "What kind of horses should be purchased," and "How may costs be decreased?" The answers are likely to follow the text discussion and this question and answer process is quite commonly used throughout the period. We might call this procedure the study and recite procedure.

When has a teacher made the best possible use of class time? When each pupil has been kept busy on work useful to him throughout the class period.¹ In addition to continued and intense activity during the class period, there is implied provision for individual differences and a feeling of worthwhileness on the part of the pupil.

Let us examine this study and recite procedure from the standpoint of some of the kinds of pupils we are likely to

find in any group. The pupil who is well prepared and understands what he has read has little to gain by mulling over the matter again. Such drill value as he will receive is not in proportion to the time spent. The pupil who wishes to clear up certain parts of the lesson may benefit by a class discussion of *these parts*. The pupil who is able but unprepared will find alluring possibilities in holding his own as well as the pupil who is prepared. The less able pupil who is unprepared will probably get something out of the discussion of the lesson. He could spend his time more profitably in study.

Since there are several groups in any class whose needs differ, it is doubtful whether the study and recite procedure provides for individual differences in any adequate measure. Observations of the study and recite procedure reveal lapses of attention of a large proportion of the class during some part of the period. Whether the pupil sees the worthwhileness of the problem depends only in part upon the kind of class procedure. But the unvarying monotony of the continuous use of the study and recite procedure does not help to maintain interest.

Another procedure which better measures up to the standards of pupil activity, the pupil's feeling of worthwhileness and provision for individual differences has been described by Professor Douglas Waples of the University of Chicago. This procedure is somewhat like that advocated by Professor H. C. Morrison² and used in the University of Chicago High School. It consists of six steps which this article will illustrate using a farm job as subject matter. However, the writer has changed the order of one of the steps and is suggesting a possible change in the character of another step to better meet the conditions of the teaching of vocational agriculture. The farm job selected is determining what land on the farm will be sown to oats next season. Or the job may be better expressed as a major question, i.e., "What land on my farm shall I put into oats next season?" It is assumed that at a previous class meet-

¹Waples, D. Procedure in High School Teaching, p. 120.

²Morrison, H. C. The Practice of Teaching in the Secondary School.

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ing the class has proposed this problem and its worthwhileness has been indicated.

Step I. The Teacher Finds Out What the Class Knows About the Unit

The experience of the class in relation to a particular unit might be discovered by means of a class discussion or by means of some sort of checking exercise. With relation to this unit, the direct experience of the boy will probably be meagre since it is a managerial problem usually dealt with by the parent. The boy's experience will usually be limited to observation, conversations with parents or neighbors and the like.

The following checking exercise is given to each boy. It should be noted that the findings in this step will affect the content of the succeeding steps. The experience of the boys will indicate what points should be emphasized and possibly what points may be eliminated.

CHECKING EXERCISE ON EXPERIENCE

Directions. Read the following statements. Check each statement which suggests to you an experience you have had, an observation you have made or a conversation you have heard. Write a brief sentence after each statement checked giving the nature of the experience, observation or conversation.

- 1. My father figured the amount of man labor on our 10 acres of oats.
- 2. My father compared oats and barley to see which crop demands work during the busy seasons of other crops or animals.
- 3. The neighbors did not agree as to the part of the United States best adapted to oats.
- 4. Very often good corn years are not good oat years and vice versa as shown by our yields at home.

- 5. My father says there is a difference between oat and barley straw both as to feeding and bedding value.
- 6. I have noticed a difference in the stand of clover when barley is used as a nurse crop instead of oats.
- 7. The land is not prepared for barley in the same way as it is for oats.
- 8. When we raise both barley and oats we find out which is the weedier of the fields on which they are to be sown.
- 9. My father remarked that if small grains must be planted on plowed sod, it makes a difference which small grain is selected.
- 10. The price of oats is higher during certain months.
- 11. We grow about the same acreage of oats each year as we do of corn.

Step II. The Class Is Introduced to the Unit

Two ways of introducing the class to the unit are proposed. The teacher may use Method A or Method B.

Method A. In the schools where this six step procedure or one similar to it is used, this second step is called the presentation. The teacher plays the main part; he presents the essentials of the unit. In relation to the farm job being used for illustration, he would present the subject matter indicated by the outline which follows. He would use illustrations to make clear every point. The presentation may take the form of discussion, lecture, demonstration. The pupils understand that they are to be tested as shown in Step III.

Method B. Teachers of agriculture have looked askance on anything resembling the lecture method. Method A does involve the lecture in many cases. The fact that the presentation is tested and the fact that it is only one of the six steps does not remove entirely the objections to it. An alternative is therefore proposed. The pupils are assigned references for study which cover the same ground as the outline below. The pupils do not recite on their reading but are tested as shown in Step III. The subject matter outlined below may be found in the following references:

Montgomery, Productive Farm Crops. Chapter 21.

U. S. D. A. Yearbook 1922.

Minnesota Agricultural Experiment Station Bulletin 205.

Wisconsin Agricultural Experiment Station Bulletin 340.

OUTLINE OF PRESENTATION. WHAT LAND ON MY FARM SHALL I PUT INTO OATS NEXT SEASON?

- A. Tabulate the acreages of oats at pupils' homes during the past season.
 - (a) Show range and median.
- B. Get reasons from pupils why their acreages might have been too large or too small.
- C. Factors which determine the correct acreage of oats.
 1. The labor requirements of oats.
 - (a) Rank local crops as to man hours required to grow an acre.
 - (b) Show monthly distribution of labor required for oats.
 2. Climatic requirements.
 - (a) Define climate.
 - (b) Give the states having the largest oat acreage and give reasons.
 - (c) Show why corn belt has large acreage.
 - (d) Describe best oat climate.
 3. Contribution of oats to the farm business.
 - (a) Straw used for feeding and bedding.
 - (b) Oats a valuable feed for horses and young stock.
 - (c) Oats serves as a nurse crop.
 4. Competing crops.
 - (a) Reasons why oats and barley compete.
 5. Cost of producing oats.
 - (a) Get estimate from class on cost per bushel.
 - (b) Take amounts of labor and materials per acre of oats in Minnesota bulletin 179 and find cost of production according to present prices.
 6. Price of oats.
 - (a) Show price curve in U. S. D. A. Yearbook 1922.
 - (b) Explain why oats are grown even though profit is small.
- D. Factors which determine on which field to sow oats.
 1. Soil requirements of oats.
 - (a) Describe soils best adapted and check with pupil observations.
 2. The place of oats in the rotation.
 - (a) Explain meaning of rotation if necessary.
 - (b) Why grown after corn or potatoes.

3. How much land available on farms.
 - (a) Brief survey of farm represented in class of size of fields in rotation.

Step III. The Teacher Finds Out How Well the Pupils Understand the Introduction to the Unit

If Method A in Step II is used, the pupil acquires the habit of attentive listening and of selecting important points since he knows he is to be tested. If the test reveals weaknesses, further presentation is made.

If Method B in Step II is used, the test stimulates purposive reading and gives training in finding sources. If the test shows weaknesses, further study may be made.

TEST ON INTRODUCTION

Put appropriate words in blank spaces.

1. The oat plant thrives best in a _____soil.
2. The oat plant is best adapted to _____weather.
3. Oats usually follows a _____crop.
4. Rank corn, hay, oats in respect to the time required to grow one acre
(1) _____ (2) _____
(3) _____
5. The heaviest demand for labor on oats comes at the _____period.
6. It cost approximately _____cents per bushel to produce oats in Minnesota in 1926.
7. The price curve in the U. S. D. A. Yearbook showed a range from _____to _____cents per bushel.
8. Three important reasons for growing oats are (1) _____ (2) _____
(3) _____

Step IV. The Teacher Provides Problems or Exercises to Give the Class Practice in Thinking to the Point

Up to this point the class has not made use of books or other reference material unless Method B in Step II was used. At this point when the class is assigned exercises, it becomes necessary to refer to books. The books are studied because they bear directly on the exercises, not because they are to be recited upon. Each member of the class will work out as many of these exercises as possible. Perhaps a minimum requirement should be set leaving some exercises for the more able students.

- I. A farmer is trying to decide on which field to grow his oats dur-

ing the coming growing season (1927).

Field A has a clay loam soil, it has been in clover during the past season (1926).

Field B has sandy loam, corn was grown on it in 1926; the soil is slightly acid; the topography is rolling.

Field C has silt loam; corn was grown on it in 1926; it is infested with sow thistle; it is level.

Which field would you select? Why?

- II. One farmer is putting forth arguments in talking with his neighbor favoring the growing of oats rather than the growing of barley. Check the arguments which are sound.

—Oats produces more total nutrients per acre.

—Weeds may be combated better by a crop of oats.

—Oats does better relatively on a sandy soil.

—Oats requires less soil preparation.

—Oats is a more effective nurse crop.

—Oat straw is more readily eaten by stock.

- III. Graph the distribution of man labor by ten day periods for corn, oats, timothy and clover, barley.

In what way does oats conflict with corn, barley, timothy and clover?

In what way does barley conflict with corn, oats, timothy and clover?

- IV. Determine the items which make up the cost of producing oats.

If you are to reduce the cost of producing oats, which items offer the most promising attack? Is it possible that you might decrease cost per bushel by increasing certain of these items? Give reasons.

- V. Tabulate for your county and Kittson County, Minnesota, the data on climate, including inches of rainfall, mean temperature, days in growing season, average date of last frost in spring. From these data draw conclusions as to whether your county has as good oat climate as Kittson County. Give reasons.

REFERENCES TO BE STUDIED WHICH BEAR UPON THE ABOVE PROBLEMS

- Cox, J. F. Crop Production and Soil Management, Chapter 2.
Montgomery, E. G. Productive Farm Crops, Chapter 21.

U. S. D. A. Yearbook 1922, p. 476-477.

University of Minnesota Geological Survey Bulletin 12. Chapter on Climate.

Minnesota Agricultural Experiment Station Bulletin 205, p. 42.

Minnesota Agricultural Experiment Station Bulletin 170, p. 40.

Missouri Agricultural Experiment Station Circular 105.

Wisconsin Agricultural Experiment Station Bulletin 340.

Step V. Teacher Provides Class with Collateral Reading to Supply Further Information Needed in Connection with Individual Exercises

In Step IV each boy worked all the exercises if the time allowed. Under Step V each boy has an individual problem assigned according to interest, ability, or need. Each problem requires the study of certain reference material.

If any of the boys is engaged in oat growing as a part of his supervised farm practice, he will work on his written plans insofar as they relate to the present unit. For example, in connection with the present unit a boy would plan the actual selection of a field at home for his oats. This means a decision as to the acreage to be grown also. The plan will contain a statement of these two decisions and will set forth the underlying reasons. These decisions and reasons should be submitted to the class.

The following are individual problems for various members of the class. When the work on these problems has been completed, certain ones may be brought before the class for report and discussion. The reason for bringing them before the class is not that it will be an opportunity to make a recitation. The reason is rather that the boy has worked out results which the class will desire to know about.

1. Find what the following references say about the soil requirements of oats including texture, lime requirement, fertility, drainage.
Wilson and Warburton, Field Crops pp. 171-172.
Wisconsin Agricultural Experiment Station Bulletin 340.
Mosier and Gustafson, Soil Physics and Management p. 187.
2. Compare the man labor distribution on oats with important local crops other than corn, barley, timothy and clover. Also animal enterprises. Find conflicts.

- App. F. Farm Economics, p. 143.
Spillman, C. H. Farm Management Chapter 20.
Minnesota Agricultural Experiment Station Bulletin 205.
3. From cost account studies find and graph the relative importance of the various cost items. Compare this graph with a similar graph worked out for corn. Draw conclusions.
Minnesota Agricultural Experiment Station Bulletin 205.
Minnesota Agricultural Experiment Station Bulletin 170.
U. S. D. A. Bulletin 1000.
 4. Graph the weekly price quotations for oats during the past year. Compare with other oat price curves. Interpret results.
Files of Wallace's Farmer.
U. S. D. A. Yearbook 1922, page 475.
 5. Look up data on the feed and bedding value of the various straws. Draw conclusions as to the relative value of oat straw.
Henry and Morrison Feeds and Feeding pp. 216, 661.
Eckles, Dairy Cattle and Milk Production p. 567.
 6. It is possible that you can buy oats more cheaply than you can raise oats. Make calculations to prove or disprove this statement.
Minnesota Agricultural Experiment Station Bulletin 205.
Minnesota Agricultural Experiment Station Bulletin 170.
U. S. D. A. Bulletin 1000.

Step VI. The Class Is Tested on the Unit

The final step in the procedure is not for the purpose of determining the grades of pupils but is to discover whether the class has thoroughly mastered the unit. No one form of test is recommended but objectivity is desirable. Morrison² recommends the best answer form, i.e., several answers to a question are suggested and the pupil chooses the correct answer. The following test is a modification of the true-false form; the pupil marks each statement true or false and briefly gives his reason. The second part of the test requires a definite conclusion on the part of each boy. A satisfactory answer indicates that he has accomplished the aim of the unit.

A. UNIT TEST. Mark each statement

² Morrison, H. C. The Practice of Teaching in the Secondary School Chapter 14.

true (+) or false (o). In a brief sentence indicate reason for your answer.

- 1. A sandy loam should be selected for growing oats.
 - 2. Oats may be seeded after sod with better results than barley.
 - 3. A dry season favors oats rather than wheat.
 - 4. Oats demands a rich fertile soil.
 - 5. Oats is not as desirable a nurse crop as wheat or barley.
 - 6. Oats is sown later than barley and therefore there is more opportunity to work the land and rid it of weeds.
 - 7. Oats is better adapted to the climate of northern Minnesota than to the Corn Belt.
 - 8. Oats has a low lime requirement.
 - 10. If a farmer must buy a straw to feed, it would be better to buy oat straw if a choice is offered.
 - 11. Corn is a more desirable feed for growing animals than oats.
 - 12. Labor is relatively a more important cost in growing corn than in growing oats.
- B. State which field at home you believe should be sown to oats during the coming season. Give acreage. State reasons for your decision.

This article has sketched one type of classroom procedure, i.e., the study and recite procedure, quite commonly used in teaching agriculture and other subjects. It was indicated that such procedure leaves much to be desired from the viewpoint of utilizing class time effectively. A six step procedure was then described and illustrated. If the teacher works out units according to the six steps described therein, considerable preparation will be required the first time a unit is given. Other teachers and other agencies can co-operate to very good advantage in the preparation of these units. After the unit has once been taught, it will be a simple matter to prepare it for succeeding classes. A unit taught according to this procedure will require more class time than if the study and recite procedure is used. This increased time is justified by increased thoroughness.

It is certain that this six step procedure will provide for individual differences. Not only does it recognize differences in study ability but it also

recognizes individual needs and interests. The provision for individual differences, the provision for checking and testing and the increased pupil activity will tend to maintain pupil interest. The most noteworthy feature is the increased pupil activity. The classroom is no longer merely a place to ask and answer questions. It becomes for every pupil a work room.

F. W. L.

AGRICULTURAL EDUCATION AT THE M. E. A.

Promptly at 9 o'clock Friday, November 5, 1926, the program of the section on Agriculture of the Minnesota Educational Association will begin in the Banquet room on the second floor of the St. Francis Hotel, corner of Seventh and Wabasha, St. Paul.

The following will be the program unless necessity compels a change:

9:00 a.m.—Banquet Room

Ashley V. Storm, Presiding

Discussion: The Course in Agricultural Economics and Farm Management, What to Teach and How to Teach it. F. E. Moore, Owatonna High School; A. F. Dahlberg, Redwood Falls High School; and others.

Address: Supervised Practice—Its Relation to the State, the Pupil and the Curriculum, Edward H. Jones, State College of Agriculture, North Dakota.

Address: Tendencies in Curriculum Construction, G. A. Selke, University of Minnesota.

12:15 Luncheon—Gopher Room

The following program will be at the luncheon table. A. M. Field, Presiding: What Good Things Have Been Done and What Ought to be Done (Each person will be expected to give a short report on some interesting thing done in his school, and may also suggest something which has not been done, but which he thinks ought to be tried.)

Responses: For the Schools: Each teacher present.

For the State Department: Paul Calrow.

For our Neighbors: E. H. Jones.

For the Teacher Training Institution: F. W. Lathrop.

It is hoped that all who have had experience in teaching farm management or farm economics will be active in discussing this subject. There are few subjects in the vocational agriculture course so nebulous as is this and the discussion

ought to concentrate on some tangible contents and methods in this subject.

We are looking forward with pleasure to hearing our neighbor, Professor Edward H. Jones of North Dakota. He is not only in charge of the preparation of agriculture teachers in the State College of Agriculture at Fargo, but is also State Supervisor of Agriculture in the public schools. Every Minnesota teacher of agriculture ought to be present to hear Professor Jones.

One of the matters that has been emphasized in the district conferences this fall and the Annual Conference last June is the formulation of the vocational agriculture curriculum about the vocational activities and needs of the individual students. Scientific curriculum making is probably receiving more attention in all fields of education than is any other subject. That agricultural education may keep abreast of the best that is being accomplished in the other fields of education, the officers of this section invited Mr. George A. Selke to present the latest tendencies in curriculum making.

At the close of the formal program we shall repair to the Gopher room which is in the basement of the same building for the annual luncheon at which Professor Field will preside. A full program is provided for the luncheon period but it will begin as soon as we are seated at the table and continue while the meal is in progress. Each person present will be expected to respond to the announcement of his name by stating briefly at least one thing he has tried in his work and give his conclusion as to its success. He will also be given an opportunity to suggest something which he thinks might be worth trying but which he has not yet tried. Each speaker after his remarks will introduce as the next speaker the person on his right (or left).

This number on the program ought to furnish valuable suggestions which the teachers can use in their classes or their community work.

Besides the Friday vocational programs the M. E. A. offers many numbers of interest to the teachers of agriculture and a large number should take advantage of this opportunity to improve their knowledge of general educational advancement and also of the latest and best in their own field. Plan to attend.

A. V. S.