THE VISITOR

Devoted to the Interest of Agricultural Education in Minnesota Schools

VOL. IX October, 1921 No. 2

FARM SHOP NUMBER

SHOP COURSE BASED ON FARM NEEDS

During the last few years there has been a constantly growing demand on the part of those interested in Vocational Agriculture for a new type of shop work.

Some form of work with wood and metal is a necessity if a student is to be given proper training for farming. A large part of his time will be devoted to repair and construction work. He needs training for this just as he does for the production of crops or the management of livestock.

Manual training is no longer considered as filling the need. The traditional content of the course is based upon exercises and tool processes. Very little change is made in content or method to meet the needs of the agricultural student. He is usually grouped with students from the general or science courses and given the same work, footstools, necktie racks, cedar chests and library tables. He learns how to polish a morris chair but nothing of roof pitch and rafter cutting.

With farm shop now a recognized part of the agricultural curriculum, the boy should make, instead of the articles named, milk stools, milk-can racks, tool boxes and work benches. What else should he do? Should his practice be confined to work in wood? For answer it is only necessary to ask what his problems will actually be on the farm. This is not difficult to discover. An attempt is here made to outline briefly the work which should be done in the farm shop.*

The average farmer spends more time in general repair work than he does in construction. This work is often poorly done, usually because of

* Based partially upon Master's Thesis of F. E. Armstrong, a graduate student in Agricultural Education, University of Minnesota, June, 1921.

(Continued on page 2)

ADMINISTRATION OF FARM SHOP COURSE

One of the most important matters in connection with Farm Shop work is its administration. The big problem in this connection is the place of the course in the curriculum. Several different methods are in use in various states and communities.

One plan that is being widely used is the placing of Farm Shop work on a plane with that in Animal Husbandry or Agronomy. The work is given in double periods throughout the year, coordinately with one of the basic courses. This makes up a "vocational half day" for the first year. It has the advantage of giving plenty of time for work in courses that are fundamental. It places the work early in the curriculum so that succeeding projects, where more or less construction and repair are necessary, will benefit from the training. In addition to this advantage there is the fact that all students, some of whom drop out of school at the end of the freshman year, should have the opportunity of taking such basic work.

Another plan is to devote part of the time usually given to the year's work in Field Crops and Animal Husbandry to work in the shop. With Field Crops offered during the first year on the double period basis, some of the time is given to shop work, more or less correlated with the study of soils and crops. The following year, more shop work is given in conjunction with the course in Animal Husbandry. If three years of agricultural work are offered, incidental shop work is continued throughout the third year.

There are certain disadvantages to be found in this plan. A vocational course in Animal Husbandry or Field Crops, if well taught, cannot be given in less than one hundred and twenty double periods (six months). With school time to be devoted to preparation for the project and time to be used for so-called supervised study, there is not much left to give to incidental

(Continued on page 4)

THE VISITOR

Published monthly by the Division of Agricultural Education, University of Minnesota, University Farm, St. Paul, Minn.

Entered as second class matter a the postoffice at St. Paul, Minn., under the act of August 24, 1912.

Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized August 2, 1918.

MAKE IT YOUR PAPER

There will undoubtedly be some articles in The Visitor to which you can make some valuable additions. We hope so. Feel free to make them.

We want The Visitor to be more than a division publication. We want it to represent the best Agricultural Education thought of the state. If you have some constructive ideas on the important problems confronting our field, send them to us and we shall be glad to give them space. Our job is your job and it is only through discussion and experimentation that we will arrive at the proper conclusions.

FARM SHOP WORK EXTREMELY VALUABLE

The course in Farm Shop has probably received more attention during the last year or two than any other single course in the agricultural curriculum. This attention has been noticeable in meetings of agricultural teachers and supervisors, in publications similar to The Visitor, and in bulletins issued by state and federal departments.

Farm Shop work is a most important and fundamental part of a curriculum in vocational agriculture. If "use" is the basis governing the value of a subject, the shop work may very properly be ranked with the courses in Animal Husbandry and Agronomy. Repair and construction problems on the farm take up much of the time and energy of the operator, and schools must recognize the need of training to make this work more efficient.

This issue of The Visitor is devoted primarily to discussions on Farm Shop work. We feel that many instructors are anxious to be of service to their communities in this work and yet hesitate to start without some definite suggestions. We are offering here what the limited space allows. We want you to feel free to write to the division for further assistance should you need it. S. D.

(Continued from page 1)

lack of proper methods. One of the principal uses of bailing wire is in this field of inefficient repair. Each boy's farm should be thoroly searched for equipment in need of repair and the work done under the supervision of the agricultural teacher. The object will not be the learning of tool processes, but the economical and efficient repair of damaged equipment.

Construction work in wood is next in order of importance. There is a wide range of training here, and if the boy does sufficient work, there need be no fear that he will not learn to handle tools. Many construction problems may be found in every community. There should always be a real need on the farm for the thing to be made and whatever it is, it should be constructed in the best possible fashion consistent with efficiency.

We are particularly interested that the work should develop in the student an appreciation of good tools and tools well cared for. He should come to realize that a good job can be done only with tools in good condition. He should then be shown how to sharpen, grind, whet, file†, set, and adjust as the case may be. He should know good tools when he sees them and know how to take care of them, to the end that his own farm shop may be well equipped.

If he is to construct he must also be able to plan and to put his plan on paper. To this end he should be expected to make a working drawing, neatly lettered, of every piece of construction he attempts. He should at least be able to make rough sketches. Mechanical drawing as a distinct part of the course should not be attempted, but only as a phase of construction. Legible working plans drawn to scale, the making of a bill of material, and the ability to read simple blue prints should be expected.

In recent years concrete has replaced much wood construction. Hardly a

† In Minnesota 77.7 per cent of the farmers sharpen their own saws.

farmer but has occasion to work with it. Mr. Armstrong found that 55.9 per cent of the farms studied used concrete in the course of a year. Students in the farm shop should get the principles of mixing, form building, reinforcing, and finish through actual practice. If there are no available jobs at the school, the farms of members of the class may be used as laboratories.

On the average farm, harness repair is not well done. Altho nine tenths of our farmers are now using rivets and one half own complete repair outfits, harnesses are often neglected. Boys should learn the value of frequent washing and oiling at least. A step further is learning to use a stitching thread and awl rather than bailing wire or rope, in making a splice. The period of harness life would be materially lengthened if only a short time were spent in the study of its care and repair. Belt lacing may well have a part in leather work.

Some rope work is desirable. Of the farms studied 49.3 per cent made rope halters. The making of the long splice for hay ropes, the short splice for quick work, several good knots, finished ends and the most valuable hitches should be given. A little useful information thoroly learned will be valuable.

The modern farm has much metal equipment. In doing repair work the student will deal considerably with metal. This work will logically divide itself into three parts, hot iron, cold iron, and sheet metal. The boy should have practice in forging, but only with those simple operations that he may be expected to use on the farm. The amount will depend upon the distance to a blacksmith. With cold iron he should deal with sawing, filing and chiseling. He should be able to use taps and dies. With sheet metal he should at least be able to use a blow torch and soldering iron in the soldering of leaky vessels.

Another part of the course which should be correlated with wood construction is finishing. The student should appreciate the value of good paint and have practice in mixing, care of brushes, and application. Other forms of finishing, such as oiling and varnishing should be practiced as occasions arise.

Some practice should be provided in cutting and setting glass, both with strips and with putty. This will be a factor in doing away with paper- or rag-stuffed wnidows.

It must be remembered that local practice of the best farmers should be the basis for deciding the content of the Farm Shop course. Communities differ widely in equipment and construction needs and the school must shape its work to meet the local situation. The local returns on the farm repair and construction blank sent to the Agricultural departments last year by F. E. Armstrong should be valuable in deciding the content of the course in each school. S. D.

TOOL LIST FOR FARM SHOP COURSE

The study on farm repair and construction work made by Mr. Armstrong with the help of the agricultural instructors gives many valuable suggestions. The summary of the record blanks gives the most definite evidence we have of conditions on the farms of Minnesota.

The equipment of the school shop should at least approximate that of the average good farm. In other words, in buying equipment the best guide will be found in the shops of the good farms. It is true, of course, that if there is some new equipment the value of which can be definitely shown, it may well be introduced through the medium of the school shop.

The following are the wood-working tools found in the shops of 560 Minnesota farms. The per cent column indicates the percentage of farmers having the tools indicated.

Tool	Per cent of farmers owning
Hand saw	97.8
Hammer (claw)	95.7
Square	88.6
Hand axe	80.4
Cross-cut saw	79.7
Hatchet	79.7
Set of bits	75.7
Brace	71.9
Jack plane	71.8
Other planes	12.1
Spirit level	66.8
Wood chisel	66.8
Draw knife	64.5
Try square	44.8
Twist drills	37.9
Expansion bit	30.4
Counter sink bit	28.0
Screw clamps	24.6
Carpenter wise	20.9
Mitre box	20.8

In addition to the main items on this list it would seem advisable that the shop be equipped with 8″ dividers, screwdrivers, wood files, carpenters' rulers, marking gauges, nail sets, keyhole saw, solid work bench with vise.

The following list will suggest the metal-working tools that should be found in the school shop.

(Continued to page 4)

(Continued from page 1)

work in the shop. The Shop course itself contains so much valuable material that a half-year of double period work is none too much. The very fact that in the above plan repair and construction is made incidental, will lead to its being slighted.

The problem of who should teach the course is theoretically simple but practically somewhat difficult. The agricultural instructor should always handle the work where it is at all possible for him to do so. The reason is obvious. The work is closely connected with the other agricultural subjects and should be correlated with them and with projects. The agricultural instructor is in close touch with home problems of the students and can thus direct the work to the best advantage.

Altho the manual training teacher understands tool processes and teaching methods, his training and inclination are not such as to make him familiar with farm repair and construction problems. He is not in as close touch with the home requirements of the students, nor is he on the job during the summer when much follow-up work is essential.

It is undoubtedly true that many agricultural teachers have had only limited training for teaching this course. It is equally true, however, that all have had farm experience and realize at first hand what has to be done in keeping equipment in working order and what things the farm boy really should have training for. Most of these men have had shop work in high school and college.

In view of the shortage of teachers trained for this work and because of the popular demand for it, some steps should be taken to correct the situation. Colleges of agriculture should be urged to give the proper sort of training to fit their graduates for the work. In the mean time, superintendents and agricultural teachers should seek to improve present conditions through summer schools and special courses for men now in service. The need for repair and construction work in the vocational agriculture course is great, and colleges must be asked to do their share. S. D.

LIST OF ARTICLES COMMONLY FARM MADE

The fifty-five wood construction items most frequently made by Minnesota farmers as shown by F. E. Armstrong's study are the following. They are arranged in the declining order of frequency.

Milk stool, wire fence, hog trough, evener, hammer handle, sawhorse, hen nest, axe handle, farm gate, file handle, hay rack, feeding trough (chicks), pig pen, stone boat, nose twist, nail or screw box, tool box, self-feeder (chicks), sledge handle, chicken crate, wagon reach, ladder, bread board, sawbuck, horse manger, calf pen, hand sled, currycomb box, grain bin, mower pitman, wagon rack (hay), feed rack (horse or cattle), step ladder, cattle manger, chicken coop, bird house, hatchet handle, seed corn tester, pick handle, mortar box, work bench, pick corn drying rack, cattle stanchion, shipping crate (hog), chicken house, hog house, hotbed or cold frame, wagon box, wheelbarrow, feed trough (sheep or cattle), watering trough, screen door, wagon bolster, screen window, and potato marker. S. D.

(Continued from page 3)

Tool	Per cent of farmers owning
Monkey wrench	96.0
Cold chisel	92.5
Grindstone	91.5
Sledge hammer	87.9
Steel punch	88.0
File (triangular)	83.7
File (flat)	77.3
Pipe wrench	76.4
Oil stove	66.1
Hammer (ball pein)	62.0
Hack saw	53.2
File (half round)	50.0
Emery wheel	45.5
Anvil	42.9
Vise (iron)	40.5
Soldering outfit	39.6
Soldering coppers	28.8
Taps and dies (bolt)	27.9
Forge	20.0
Gasoline torch	18.7
Taps and dies (pipe)	14.3

In addition there should be—

Hardie to fit anvil
Tongs (straight lip)
Tongs (bolt)
Tin snips, 3½-in. cut
Saw clamps
Saw set
Pliers

The following leather working equipment is suggested by L. M. Roehl of New York—

Sewing awls
Awl haft
Knife (harness makers straight)
Punch (revolving 6 tube)
Sewing horse (shop made)
Wax (shoemakers' black)
Paper No. 7 needles
Harness thread (No. 10 white)
Assorted split rivets
Black harness soap
Can harness dressing
Riveting machine
Tubular harness rivets (assorted)

No attempt has been made in outlining this tool list, to designate the number of each article to be secured. This will depend largely upon the size of the classes and the amount and nature of the work to be carried on. Certain tools, as hammers, rules, and try squares, should be supplied, one for each pupil. Others, as saws, framing squares, and planes, may be shared by two or more. S. D.