UNIVERSITY OF KENTUCKY

COLLEGE OF AGRICULTURE

Extension Division

THOMAS P. COOPER, Dean and Director

CIRCULAR NO. 82

(Fourth Edition, Revised)

Corn Project, Junior 4-H Clubs

Lexington, Ky.
December, 1930

Published in connection with the agricultural extension work carried on by cooperation of the College of Agriculture, University of Kentucky, with the U. S. Department of Agriculture and distributed in furtherance of the work provided for in the Act of Congress of May 8, 1914.

REQUIREMENTS

1. The project is for boys from 10 to 18 years of age.

2. Members must attend their club meetings.

3. Members must study the instructions given in this circular.

4. Each member must agree to grow at least one acre of corn and to follow the advice of his county agent and project leader.

5. The crop must be in one piece of ground.

6. A member 14 years of age or older, must do all his work. If under 14 years he may have assistance for the heavy work, but he must keep his own records.

7. Each member must keep a record of all work done on the project, in a book which his county agent will give him.

8. Two disinterested persons must accurately determine the yield on the acre and sign the club member's record book.

9. At the close of the project each member should exhibit 10 ears of corn at the county fair, club fair or some other exhibition.

10. Prices for horse labor, man labor, etc., given in the record book must be used in calculating the net return from the project.

CIRCULAR NO. 82
(REVISED)

Corn Project
Junior 4-H Clubs

By E. J. KINNEY and E. E. FISH

Corn is the most remarkable cereal crop in the world. The ability of corn to yield when soil and weather is favorable is very much greater than that of other grain crops. Corn is grown in every section of Kentucky and is her most important crop.

From 1924 to 1928 Kentucky produced an average of 80,949,000 bushels of corn per year. The average yield per acre during these years was 26.5 bushels. Every 4-H club member enrolled in the corn project can more than double such a yield per acre with a selected plot during an average season by following instructions given in this circular. The state corn project champion in 1930 produced 99½ bushels on an acre of ground.

The objects of the corn project are (1) to teach a good method of corn culture, (2) to furnish profitable employment for a part of the club member's time during the summer, (3) to stimulate interest in farm life among farm boys.

Club members strive for a large yield per acre because that means more corn for feeding and a smaller relative cost of production. Many items entering into the cost of production are the same, whether the yield be large or small. Taxes, rents, plowing and much of the seed bed preparation will be the same.

PREPARING FOR THE CROP

Selecting the Plot. The foundation for successful corn growing is soil fertility. Corn is given its place in the crop rotation immediately following the turning under of a clover or

alfalfa sod. Most profitable yields are obtained from moderately low-lying but well drained soils of the loam types.

Applying Manure. The soil should contain a large amount of humus and organic matter. To insure this plow under clover or alfalfa sod. The application of 6-8 loads of barnyard manure is a still further guaranty. This may be applied before breaking the land or, if not too coarse and strawy, after breaking. The latter method often gives slightly better results.

Plowing. Land is plowed to loosen it, to destroy weeds, and to cover organic matter. More rainfall is taken up by plowed than by unplowed land. Fall plowing has some advantages. The larvae of harmful insects, such as cutworms and grubworms are brought to the surface and destroyed by exposure. Fall plowing exposes the soil to the mellowing action of freezing and thawing and hastens the decay of the organic matter (clover, manure, etc.), which was plowed under. However, where land is hilly it is not advisable to plow in the fall because this would subject the soil to serious losses by washing and leaching. Land to be plowed in the spring should be plowed as early as possible to a depth of about seven inches.

Preparing the Seed-Bed. Sod ground, after plowing, should be worked with a disk harrow. If a disk harrow is not available, a spring-tooth harrow may be used. A fairly good seed-bed can be prepared by repeated harrowing with a sharp spike-tooth harrow. The harrowing should be repeated at intervals until planting time. This keeps down weeds and conserves moistures which would be lost rapidly if a hard crust were allowed to form. Thoro preparation of the soil is very important.

Using Commercial Fertilizer. Phosphorous is the element most lacking in manure. It can be supplied in various forms to make a proper balance. If manure is used, the fertilizer application should be 300 pounds of superphosphate or basic slag. If more convenient, 200 pounds per acre of steamed bone meal may be used. Where lime is used, however, superphosphate is preferable. The superphosphate and lime, where the latter is used, should be spread broadcast on the plowed land before

preparing the seed-bed, so that harrowing will mix them with the soil thoroly. Where manure is not available phosphate fertilizer, as just suggested, should be used and in addition, 300 pounds per acre of a mixed fertilizer containing 3 to 4 percent nitrogen, 8 to 10 percent phosphoric acid and 3 percent potash should be applied in the hill at planting time.

Selecting the Variety. Use a variety that is successful locally. Corn which matures too early for the locality is usually undersized and does not yield so well as a variety which takes up more of the growing season. Several varieties of both white and yellow corn have been used by Kentucky corn project members with equal success. The white varieties include Boone County White, Johnson County White, Pride of Saline, Neals Paymaster and Tennessee Red Cob. Reids Yellow Dent has given good satisfaction as a yellow variety.

Testing the Seed for Germination. Many inferior corn yields are caused by poor germination of seed. A club member wishing to stand high in his club will not take a chance on planting corn from dead or diseased ears. The germination test is the only guide to follow. Write to the Department of Agriculture, Washington, D. C., for Farmers' Bulletin No. 948 which explains in detail how to test corn for germination. The bulletin will be sent to you free upon request. Do not use seed which tests less than 98 percent germination.

Grading the Seed. The seed should be graded after testing for germination. Shell the corn, discarding the irregular grains on the tips and butts of the ears. Seed that is uniform in size and shape is obtained in this way. Such seed will be dropped with greater regularity by the planter, and a more uniform stand will result.

Measuring the Plot. Before planting be sure that the plot contains more than the required acre, 43,560 square feet. Two disinterested persons should measure the acre before the corn is eight inches tall, preferably before the crop is planted. Provision should be made for turning the horse or mule outside the measured acre. Drive good, strong posts which will remain thruout the season in the corners of the measured acre. Any rec-

tangular plot which contains the necessary amount of ground is satisfactory. However, avoid excessive length and few rows.

PLANTING

How to Plant. If a corn planter is used test it and regulate it so as to drop the desired number of grains each time. Whether to plant in checks or drills should be decided by the local conditions. If the ground is weedy the corn should by all means be planted in checks. On hillsides, it is necessary to drill. There seems to be little difference in the yield of corn whether drilled or checked. If planted in checks the hill should be 3½ feet apart, in rows 3½ feet apart. In hill planted corn use 4 grains to the hill and in drilling plant two at each place, averaging about 1 foot apart. This rate of planting is used especially for test acres. It would not always be practical in large acreages. However, many farmers regard it as very profitable to plant heavily and thin after the corn is a foot high. After the danger from cutworms and other larvae is past thin to two stalks in the hill or one stalk in each place where drilled. Where large-growing varieties such as Boone County White are used on rich bottom land or land that holds moisture well, three stalks to the hill may be left. If small-growing sorts are used, always leave three stalks to the hill on good land. Corn should be planted only deep enough to place the seed in moist earth. There is no advantage in planting very deep as it takes longer for the corn to come up; in fact there is a chance that it may never come up.

When to Plant. The corn should not be planted until the ground is warm. The time for planting varies somewhat in different localities and in different years, because of varying seasonal conditions. Most of the corn in this state is planted between the 25th of April and the 10th of May. Community experience as regards time of planting is a very valuable guide and the best practis is to plant when the best farmers of the community are planting the main crop. Neither very early nor very late planting should be practist.

CULTIVATION

Reasons for Cultivation. The reasons for cultivating corn may be summarized as follows:

1. To destroy weeds. This is probably the most important reason. In fact, it is a much debated question whether or not more cultivation than is necessary to keep weeds down is beneficial.

2. To conserve moisture. After heavy rains the soil is packed so that a crust forms on the surface. This crust aids in the evaporation of the water from the soil. Breaking up the crust by cultivating lessens this loss.

3. To aerate the soil. By breaking up the crust, air is allowed to circulate more freely in the soil, thus favoring the growth of useful bacteria and making plant food available.

4. To let the water from rains sink into the soil quicker by keeping the surface loose and porous.

5. To warm the soil. When water evaporates, much heat is used up; therefore, if keeping the soil loose on top helps to keep water from evaporating from the soil, it also helps to keep the soil warm.

Depth of Cultivation. Sometimes the first cultivation is given by going over the field with a light spike-tooth harrow soon after planting. If the harrow is light and the teeth are set to slant backward a little, this method can be used safely on plants 3 or 4 inches high. The advantage of harrowing is that it kills the young weeds in the rows as well as out of the rows and it also leaves the ground smooth. The first plowing may be deep and close to the plants. At no time should the cultivation be close enough to disturb the roots. Later cultivation should be shallow and preferably done with a cultivator which has many small teeth or shovels. Don't use the old-fashioned double shovel or bull-tongue plow unless absolutely necessary, because these tend to injure the crop by cutting off many of the feeding roots and also by permitting greater evaporation of moisture from the soil by leaving the ground with ridges and deep furrows. Cultivate whenever necessary to kill weeds and also as soon as possible after a rain to break up the crust and make the

surface of the soil fine and loose. Frequent, shallow cultivation in the early stages of growth gives the best results.

Number of Times to Cultivate. This will depend upon the kind of soil and the weather which each season brings. Not fewer than three or as many as five cultivations may be needed to keep the plot free from weeds. The growth of weeds on a plot shows a lack of cultivation.

INSECTS AND DISEASES

Insects. Both field and sweet corn are subject to injury by several destructive insects. Some work on the roots and others eat the leaves or ears.

The wireworm, white grub, or "mully grub," and the corn root worm attack the roots. These pests are the larvae of beetles and methods used to combat them must be in the nature of cultivation. Corn should not be grown on the same field year after year, because this is favorable to the increase of these insects. Rotation of crops should be practist. Fall and winter plowing destroys a great number of these insects as they are brought to the surface and subjected to freezing. Also this will kill many larvae which spend the winter in the soil and feed on the corn above ground during the growing season.

One of the worst corn pests is the corn ear-worm. It is found in the tip of the ear of corn. Fall plowing helps to control this insect, it is believed.

Diseases. Corn smut is one of the most common diseases found in corn fields. Cut off the affected stalks, carry them out of the field and burn them.

FIELD SELECTION OF SEED CORN

Field selection of seed corn should be made just before corn cutting time. A sack slung over one's shoulder is a convenient receptacle for carrying the ears. Go thru the field and gather the ears that look good for seed. About three times as many ears as are needed should be selected.

Size of Ears. Select large, well-matured ears from hills having the full number of stalks. Ears should be well propor-

tioned; that is, the circumference should be about three-fourths the length.

Kind of Stalk. It takes a large, stout stalk to support a large, heavy ear, but not necessarily a very tall one. In the field selection of seed select only from such stalks as are able to bear the weight of heavy corn. When seed is selected from the crib one knows nothing about the parent stalk; therefore, this way is not so good as selecting in the field.

Position of the Ear on the Stalk. Ears that droop should be selected. Sometimes birds tear open the husks and, if the ears point upward, water enters and the germinating power of the seed is injured. If the ear is too high above the ground, the plant is easily blown down; therefore, select ears that are of medium height above the ground. The shanks of the ears selected should be medium in length, and strong.

KEEPING THE SEED CORN

String the ears (see cut on title page) and hang them in a dry, well-ventilated place.

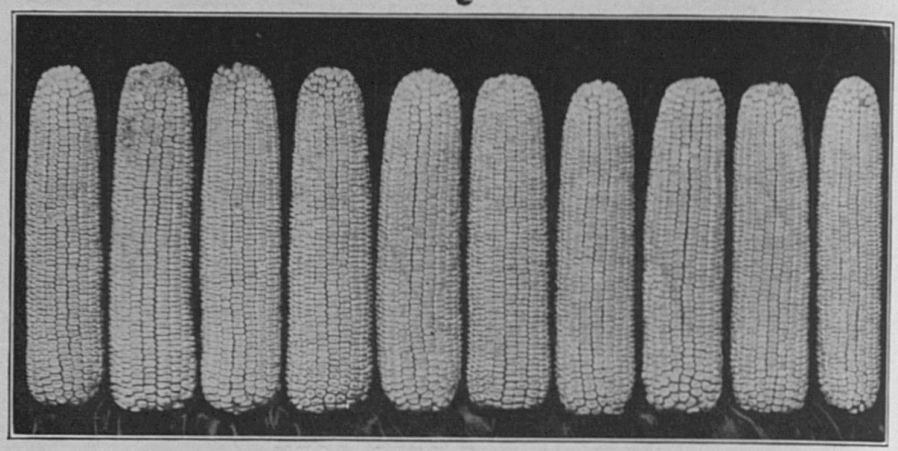
SELECTING EXHIBITS

An exhibit is an important part of the corn project. Each club member is required to show a 10-ear sample of his crop. This exhibit may be displayed at a county fair, school fair or local club fair.

The county agent will have someone to judge the exhibits. This judge will have several things in mind when he looks over the exhibits, and we want club members to know what the most important of these things are, so they can select their samples of ten ears intelligently. First, a judge will be influenced greatly by the uniformity of the exhibit. This means that each ear should be just as much like every other ear as possible. Second, he will insist that the ears be up to a certain standard in size and that they be well proportioned. He will insist that all ears be absolutely sound and will penalize heavily for any indications of unsoundness. Finally, the judge will be influenced by the finish of the ears; that is, the way the tips are covered and the finish of the butt ends of the ears.

Shape of Ears. All ears should taper slightly. Care should be exercised that they do not taper too much nor too sharply.

Size of Ears. Never select abnormally large ears for an exhibit. Medium ears are best.*



A Well-Selected Exhibit.

Purity. All grains in an exhibit should be of the same color. If it is an exhibit of white corn, all grains should be white. If there are any red or yellow grains it shows that the corn is not pure. In an exhibit of yellow corn there should be no white or red grains. White corn preferably should have white cobs, but some varieties of white corn have red cobs, so the important point is to have the color uniform. Yellow corn should have red (or pink) cobs.

Tips and Butts. The tips and butts should be well filled and carry as nearly as possible the same size and shape of kernel as the rest of the ear.

Type of Grain. An ideal kernel is slightly wedge-shaped, but not pointed. The kernels should fit well up against one another so that little space is lost between rows. The rows should be straight and extend from butt to tip. It is desirable that the grains should have a medium dent.

Type of Germ. The germ should be large, broad and healthy. A large, broad germ indicates vitality and strength.

*See score card standard.

Number of Rows. The number of rows will vary with the variety of corn.

Character of Cob. The cob should be medium in size. A small cob is broken easily. When cobs break, much grain is lost in handling and shipping. If the cob is too large, the ears are slow in drying and the corn may spoil in the crib.

Freedom from Disease. Corn that is diseased should not be selected for exhibit. Look for smut and mold. Never select corn with mouse-eaten grains.

Maturity. Ears should be dry and sound. Shrunken, wet or loose grains on the cob indicate immaturity.

Varieties. In selecting a variety of corn for the project consult the county agent or use the variety that is most common in the neighborhood.

KEEPING RECORDS

Keep the record book up to date as the work is done. Every time something is done connected with the acre of corn enter it in the record book. The number of hours required for plowing, planting cultivation, etc., should be put down as the work is done. Then when the crop is harvested and the yield determined, a short summary will show exactly the cost of producing the crop. Don't try to remember items of expense. Let the record book do the remembering. First, last and all the time, keep up the record. The State champion corn project member is determined from the yield and project record.

STORY OF THE PROJECT

Subject. "How I Raised an Acre of Corn."

Instructions. The story must be the work of the club member. If written by another person it will not be accepted. Pen and ink should be used. Everything of interest connected with the project should be told. If the story is interesting and well written it may be sent to some farm journal for publication.

The following outline may help:

1. Tell how and why you enrolled as a member.
2. Explain where you obtained seed and what variety.

3. Describe how you tested your seed corn.

4. Selection and preparation of the ground, including treatment.

5. Planting and cultivation of your crop.

6. Diseases of corn; insect pests.

7. Harvesting, storing and marketing your corn.

8. Selection of seed corn for next year. What method was followed?

9. Exhibits: description, place held, prizes won.

10. Give a careful account of the yield, total number of bushels, amount sold, price at which it was sold, discussion of expenses and profit.

11. What has club work done for you?

12. What improvement would you make next year in an acre of corn project.

13. Give anything else that will be of interest.

14. Possibly a few photographs will help in telling the story.

CLUB SCORE CARD—CORN JUDGING

Date .....

Number of exhibit .....

Name of variety .....

Name of club member .....

POINTS	Perfect Score	Judge's Score	
1. Uniformity of exhibit	5		
2. Shape of ear	10		
3. Length of ear	10		
4. Circumference of ear	5		
5. Tips of ears	5		
6. Butts of ears	5		
7. Kernel, uniformity	5		
8. Kernel, shape	5		
9. Color in grain and cob	10		
10. Space between rows	5		
11. Vitality or seed condition	15		
12. Trueness to type	10		
13. Proportion of shelled corn to cob	10		
Total	100		

Remarks: .....

.....

.....

REFERENCES

Farmers' Bulletins—414, 537, 948 and 1175, Department of Agriculture, Washington, D. C.

Extension Circular—56, Farm Crops, College of Agriculture, Lexington, Ky.

STORY—HOW I GREW MY ACRE OF CORN

STORY—HOW I GREW MY ACRE OF CORN

STORY—HOW I GREW MY ACRE OF CORN