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BULLETIN NUMBER XXIV

THE NORTH CAROLINA CORN BULLETIN

BY

E. E. BALCOMB

DEPARTMENT OF AGRICULTURAL EDUCATION

NORTH CAROLINA STATE NORMAL AND INDUSTRIAL COLLEGE
GREENSBORO, N. C.

ISSUED FROM THE OFFICE OF
STATE SUPERINTENDENT OF PUBLIC INSTRUCTION
RALEIGH, N. C.

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An ambitious Corn Club Boy and a faithful white mule are a combination hard to beat.

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TO THE TEACHER

In preparing this little bulletin to help the teachers of North Carolina in presenting the very important subject of corn to their classes, the author claims no originality, but has referred freely to the many bulletins, books and pamphlets which treat of elementary agriculture, and the corn plant in particular. There are so many of these excellent publications and so much of their work is duplicated that it would be impossible to designate whence every particular item of information came. Credit has been given where practicable. There is one publication which deserves special mention, not only because I have quoted freely from it but because it has been a guide to me in a more general way. I refer to the book "Teaching Agriculture in the Rural and Graded Schools," by Prof. E. C. Bishop. Professor Bishop has done more than any other one man to develop the work of agriculture and domestic science among the schools of the United States. He was a pioneer in organizing boys and girls into clubs for rural activities.

I am especially indebted to Professor C. B. Williams, of the North Carolina Agricultural and Mechanical College for valuable suggestions and for his contribution of most important chapters. These, the teachers will find very helpful.

The teachers should depend upon the North Carolina Agricultural College and Experiment Station, and the State Department of Agriculture for bulletins and advice. This is referred to under the topic, "Some Materials to Help in the Study of Corn." This topic, together with those on "Systematic Preservation of Information" and "Industrial Work for Pupils" should be read by teachers before beginning work since they will wish to make immediate use of the suggestions.

CONTENTS

BOTH THE CORN AND THE MAN IN THE MAKING.

Bryan McCormick of Rowland, N. C., Corn Club Boy.

All through the long, bright days of June
Its leaves grew green and fair,
And waved in hot midsummer's noon
Its soft and yellow hair.—*Whittier.*

COLUMBIA'S EMBLEM

Blazon Columbia's emblem,
The bounteous, golden corn.
Eons ago, of the great sun's glow
And the joy of the earth, 'twas born.
From Superior's shore to Chile,
From the ocean of the dawn to the west,
With its banners of green and silken sheen
It sprang to the sun's behest;
And by dew and shower, from its natal hour,
With honey and wine 'twas fed,
Till on slope and plain the gods were fain
To share the feast outspread:
For the rarest boon to the land they loved
Was the corn so rich and fair,
Nor star, nor breeze, o'er the farthest seas,
Could find its like elsewhere.

Illustration from "Agriculture for Beginners." Kindness Ginn & Co.

In their holiest temples the Incas
  Offered the heaven-sent Maize—
Grains wrought of gold, in a silver fold,
  For the sun's enraptured gaze;
And its harvest came to the wandering tribes
  As the god's own gift and seal,
And Montezuma's festal bread
  Was made of its sacred meal.
Narrow their cherished fields; but ours
  Are broad as the continent's breast,
And, lavish as leaves, the rustling sheaves
  Bring plenty and joy and rest;
For they strew the plains and crowd the wains,
  When the reapers meet at morn,
Till blithe cheers ring and west winds sing
  A song for the garnered corn.

The rose may bloom for England,
  The lily for France unfold;
Ireland may honor the shamrock,
  Scotland her thistle bold;
But the shield of the great republic,
  The glory of the west,
Shall bear a stalk of tasseled Corn,
  The sun's supreme bequest.
The arbutus and the golden rod
  The heart of the North may cheer,
And the mountain laurel for Maryland
  Its royal clusters rear,
And jasmine and magnolia
  The crest of the South adorn;
But the wide Republic's emblem
  Is the bounteous, golden Corn.

—*Edna Dean Proctor.*

[From "The Nebraska Corn Book."]

NOTE. The National Grains' Convention at Portland, Oregon, enthusiastically adopted corn as our national floral emblem. Edna Dean Proctor, author of "Columbia's Emblem," says: "Indigenous to America and peculiar to it—a part of all tradition and history of the Western continent—preëminent in value and beauty—corn is our most distinguished plant and must be,—*is* our national floral emblem."

TEACHING THE TEACHERS TO TEACH AGRICULTURE.

Pleasant Garden and Jamestown Farm-Life High Schools giving demonstrations and exhibits of work in agriculture before the State Teachers' Assembly at Charlotte, November, 1914.

THESE ARE THE CORN CLUB BOYS THAT HAVE MADE McDOWELL COUNTY, N. C., FAMOUS.
MISS MAUD BARNARD, SPECIAL SCHOOL SUPERVISOR, AT RIGHT.

CORN DAY

Heap high the farmer's wintry hoard!
Heap high the golden Corn!
No richer gift has autumn poured
From out her lavish horn!—*Whittier.*

Every year there should be a day set apart in all the public schools of North Carolina to be known as Corn Day. On this day all the interests of the community should center around this great crop. For several weeks, the teacher, the school, and the patrons should be quietly making preparations for the events of Corn Day.

The primary object of Corn Day should be to emphasize the importance of the great corn crop, to encourage diversified farming, and to bring the home and the school more closely together. In gathering the material for Corn Day the children will use all of the knowledge they have gained about the selection of corn and the judging of corn. The teacher will give all possible additional information. While corn should be the main feature, this may be a time of exhibiting other farm produce, community handiwork, and school work. In other words, it would be a *community fair* with *Corn* for the central idea.

The Corn Club boys and the Tomato Club girls should begin, during the winter, to plan to celebrate Corn Day the following autumn by reading and studying about corn and its culture, tomatoes and their care. They should choose the soil early in the spring and thoroughly prepare it for the best crop it is possible to raise; and make every possible effort to have a fine local exhibit on Corn Day.

All reports and compositions on corn and corn growing, the agricultural booklets (explained in another place in the bulletin), apparatus made by the pupils, and similar material should be neatly prepared for exhibition. Whenever practicable, appropriate covers should be made for papers. Pupils should make an effort to make their work worthy of being exhibited at the State Teachers' Assembly in the industrial exhibit arranged by Supervisor Brogden. Teachers should select an exhibit for the Teachers' Assembly from the Corn Day Exhibit. This will offer an incentive to pupils to do good work. The local exhibit will give the teacher material from which to make a selection.

On the occasion, the schoolroom should be decorated with every suitable material from the corn plant—great, tall stalks stood in the corners; ears of corn hung by the husks or piled on the floor; words and designs made from the cross sections of ears of corn, from kernels of corn, etc.; pictures of corn and corn fields; the children's exhibits nicely arranged on tables.

The manual training class could exhibit many things made from the corn plant, such as corn husk mats, whisk broom holders, doll mats, braided baskets, school bags, doll furniture from corn stalks, and many other things which will occur to live wide-awake boys and girls.

The little folks, for busy work, could make long strings of kernels of field corn, and others of popped corn, for wall decorations. Some of these strands might be worn as strings of beads, and would be a splendid decoration for girls to wear in some exercise or drill.

The tomato should be prominent in every possible way. Other products of the farm may also be used to make the schoolhouse attractive, but *corn* and *tomatoes* should be the feature of the occasion. The exhibition of house plants, flowers, and products of the garden should be encouraged. All kinds of manual work—sewing, and cooking should be conspicuous.

Prizes should be offered for as many things as practicable, but the sentiment should be created that the things are produced for their own value and for the real training in character-building which the children get by doing the work.

A very simple program should be provided with Corn and Tomatoes as the central themes.

The children might well prepare invitations and send them out to the patrons of the school. These invitations may serve as a lesson in correct English, in penmanship, and, by decorating them with ears or stalks of corn, tomatoes, or something else appropriate, as a most interesting drawing lesson.

A valuable feature of the program might be reports on the following and similar topics: The number of acres of corn raised in the school district; the yield of corn obtained in different fields in the school district; a comparison of these figures with those showing the average for the county, the average for North Carolina, the average for the United States; a comparison of the statistics for the district with those of neighboring districts; the manner of gathering and preserving seed corn, and the cultivation and harvesting of corn as practiced by different farmers in the school district, compared with the best methods used elsewhere.

To make the day most valuable the importance of the corn crop in *the particular community* must be emphasized. The reports and discussions must not consist in generalities and pertain to things and interests far away, but must be concerned with the local problems in which the school and the community are mutually interested.

The following programs are suggestive:

Song—"Carolina" ..... By School
Recitation—"The Corn" ..... A Pupil
Reading of a letter from State Superintendent J. Y. Joyner to the farm boys on "The Education to be Obtained Through Growing Corn."
Why the People in the United States Raise Corn ..... A Pupil
Why the People in our School District Raise Corn ..... A Pupil
"Husking Song" ..... By School
Recitation—"Pop Corn."
Reading of a letter from Professor Browne in charge of Boys' Corn Clubs on "What Corn Club Boys are Doing."
Recitation—"Blessings on the Corn Field."
Discussion—Advantages and Disadvantages of Testing Seed Corn
By Several Pupils
Recitation—"The Barefoot Boy."
Reading of a letter from Professor Williams on "Some Essential Factors in the Production of Good Corn."
Discussion—Is the Silo the Best Means of Saving Fodder for Cows?
By Two Boys
"Pop Corn Song" ..... By School
Judge and award prizes. (Have an abundance of pop corn to eat.)

Song—"America" .....By School
Address.....By Selected Speaker
Pupils could give talks or read papers on subjects related to corn, as: the germination of corn; how corn should be cultivated; best kind of corn to grow in the district; a comparison of the Indian's method of planting corn with that of the white man; the white man's use of corn for food as compared with the Indian's use of corn for food.
Corn Drill .....By Children
Brief reports from boys on growing their acre of corn.
What must I know to be a good judge of a corn exhibit?....By Several Pupils
Song.....By the School
A seed corn tester, exhibited and explained.....By a Pupil
An exercise—ten or more children give and explain briefly one good use of corn. (Children decorated with corn in some manner.)
The Corn Story. (Carpenter's Geographical Reader.)
Song—"A Carolina Farm for Me!"
The judging of exhibits and the awarding of prizes.
Song—"Carolina" .....By the School

RURAL PEOPLE COMING FOR A CORN DAY EXERCISE.

Courtesy of "Kimball's Dairy Farmer," Waterloo, Iowa.

CONTEST CORN CAME CONSTANTLY, AND EVERY BIG BAG BROUGHT A BRIGHT BOY.

Photo by "Kimball's Dairy Farmer."

There should be a basket or picnic dinner served. Within reasonable bounds, this should emphasize the use of corn as food.

After the Corn Day at each schoolhouse, there could very profitably be held a COUNTY CORN DAY. At this time the Boys' Corn Clubs, and Girls' Tomato Clubs could receive their prizes given by the county or other agencies for competition in the county. Appropriate exhibits and literary exercises, together with a picnic or basket dinner, should be the main features of the day. Athletics could very profitably be given a place in the day's exercises. It always draws a crowd. It furnishes good entertainment. The play spirit needs to be encouraged among farmers.

Nothing could give a more fitting climax to this series of Corn Days than to have a NORTH CAROLINA STATE CORN DAY in connection with the STATE TEACHERS' ASSEMBLY. Here could come the prize winners from every county in the State with their displays of prize corn and tomato products. The exhibit and study of corn and tomatoes, together with the exercises, would be very profitable for the assembled teachers. It would turn their attention for a moment from the problems of the class room and show them that here were great educational possibilities that should be connected more closely with the schools. It would give another reason for closing the schools so that teachers and pupils alike could attend. It would interest many people not strictly in the teaching profession.

THE IMPORTANCE OF CORN AND ITS PRODUCTS

Prof. Warren, in his "Elements of Agriculture," suggests that had it not been for the great development of the middle western states, owing to their magnificent crops of corn, the history of the United States might have been different. Corn is the greatest single crop that the United States harvests. Its greatest value to the human race as a food is not the enormous amount that is used directly as corn bread, green corn, etc., but it is the millions of bushels fed to cattle, hogs, sheep, poultry, etc., which are to be used in the form of meat, eggs, butter, milk, etc. It is the food preëminent for fattening stock.

The early settlers of the United States were doubtless saved many times from starvation by the corn they procured from the Indians or what they themselves grew. Its cultivation was so simple that they soon learned it from the natives. It is said that corn yields twice as much food for the same amount of labor as almost any other grain.

The Indians, who lived in Mexico when the Spanish came, soaked the grains of corn in hot water to which was added a little lime. They beat it into a paste which they baked in thin cakes on hot stones. The Spanish called this "tortillas," which is a popular bread in Mexico today. In most parts of the present United States the Indians ground the hard grains of corn in a stone mortar, making a coarse, raw meal. This they mixed with water and baked in thin sheets on heated rocks calling it "guaguva," and various other names. From these simple methods the settlers developed the "ash cake," the "hoe cake," the "corn pone," the "journey cake" or "Johnny cake." They also had other methods of cooking corn and its products, giving us such dishes as succotash, hominy, samp, and even popcorn.

It has been said that there are more than one hundred different articles made from corn. A few of the leading ones are corn starch, glucose, corn syrup, paper, oil, explosives, corn cob pipes, breakfast foods, and, I am sorry to say, even alcohol and whiskey. In our prohibition State I am sure the children will be glad to know this poem from "Teaching Agriculture in Rural and Graded Schools":

The Song of the Corn.

I was made to be eaten,
When ground at a mill;
To be shelled in a barn,
Not run through a still.

I come as a blessing
When put in the mill;
As a blight and a curse
When run through a still.

Make me into loaves
And your children are fed;
But if into drink,
I will starve them instead.

Then remember the warning—
My strength I employ,
If eaten to strengthen;
If drunk to destroy.

IT'S A CAROLINA FARM FOR ME!

In North Car-o-li-na We live well, Tho war makes pri-ces high; For
we can raise what we can eat, And we don't have to buy. Hoo-oo ray! Hoo-oo
rah! Oh, we don't have to buy, For we can raise what we can eat, And
we don't have to buy.

CHORUS

Hoo-oo- ray! Hoo-oo- roh! For crop di-ver-si-ty! The Tar-heel can live well, Tho he
Nei-ther buy nor sell. It's a Ca-ro-li-na farm for me!

IT'S A CAROLINA FARM FOR ME!

In North Ca-ro-li-na we live well,
Tho war makes prices high;
For we can raise what we can eat,
And we don't have to buy.
Hoo-oo-ray! Hoo-oo-ray! Oh, we don't have to buy;
For we can raise what we can eat,
And we don't have to buy.

CHORUS:

Hoo-oo-rah! Hoo-oo-rah! For crop di-ver-sity!
The Tar-heel can live well,
Tho he neither buy nor sell.
IT'S A CA-RO-LI-NA FARM FOR ME!

And we can eat what we can raise,
And we don't have to sell;
So, if they won't buy cotton crops,
Why, let them go — a spell.
Hoo-oo-ray! Hoo-oo-ray! Oh, we don't have to sell;
So, if they won't buy cotton crops,
Why, let them go — a spell.
—Chorus.

And we can can what we can't eat,
Can eat what we can can.
"We can," 's the plan. We plan to can.
We can! We can! We can!
Hoo-oo-ray! Hoo-oo-ray! 'can eat what we can can.
"WE CAN," 's the plan. We plan to can.
WE CAN! WE CAN! WE CAN!
—Chorus.

The TOMATO GIRLS and BOYS' CORN CLUBS
Will make the State our pride,
When they have shown what can be grown
With crops DI-VER-SI-FIED.
Hoo-oo-ray! Hoo-oo-ray! Will make the State our pride,
When they have shown what can be grown
With CROPS DI-VER-SI-FIED.
—Chorus.

TABLES TURNED—TEACHING TEACHERS.

Jamestown and Pleasant Garden Girls from Farm-Life Schools demonstrating Domestic Science and Art at Charlotte, N. C., November, 1914, for the benefit of the State Teachers' Assembly. The exhibit was a part of their regular school work.

BANISH BAD BISCUIT.

Pupils from elementary schools of Sampson (Autryville) and Alamance Counties demonstrating at the State Teachers' Assembly, Charlotte, November, 1914.

They served a unique luncheon for distinguished educators. Among them were the State Superintendent, U. S. Commissioner of Education, President of the North Carolina State Teachers' Assembly, State Supervisor of Rural Schools, President of the Charlotte Women's Clubs, and other distinguished guests.

Let vapid idlers loll in silk
Around their costly board;
Give us the bowl of samp and milk,
By homespun beauty poured!

Where'er the wide old kitchen hearth
Sends up its smoky curls,
Who will not thank the kindly earth,
And bless our farmer girls!

HISTORY OF THE CORN PLANT

Enough time should be given to the study of the origin of Indian corn and its importance in the development of the nation to make the pupils intelligent on this subject. An abundance of material will be found in "The Encyclopedia of American Agriculture," Vol. II, page 398; "The Book of Corn," "Corn Plants, Their Uses and Ways of Living," by Sargent, published by Houghton, Mifflin & Co., Boston; "The Nebraska Corn Book," "Corn," by Bowman & Crosby; and many others. A few of the most important facts are all that space will permit here.

It must be remembered that the word "corn" is used in a far wider sense in many parts of the world than is common in many parts of the United States. For example, when we read in the Bible: "Thou shalt not muzzle the ox that treadeth out the corn," or where Samson tied the tails of the foxes together and "let them go into the standing corn of the Philistines and burnt up both the shocks and also the standing corn," or where Ruth asked permission of her mother-in-law to go to the field and glean "ears of corn," she went and did "glean and gather after the reapers among the sheaves,"—the writers evidently did not mean our Indian corn, as this plant was not known to the civilized world until after Columbus discovered America. When Columbus wrote letters to Spain from the new world he told of a kind of food the natives offered him. As nearly as he could write it, they called it "mahiz," so we have "maize," or Indian corn, which was then a new plant in the civilized world. It has not spread rapidly over Europe as has the potato which is also an American plant. Almost all the Indian corn is grown in the United States, Argentine, Mexico, the southern parts of Europe and Egypt. The United States produces about two-thirds of all the corn grown.

The American corn doubtless originated in Mexico from a kind of grass, teosinte. Corn belongs to the grass family along with wheat, oats, rye, barley, rice, sorghum, sugar cane, and many other useful plants. The botanical name of corn is *zea mays*. Its development is very interesting. It has been gradually improved since the early settlers found the Indian squaws (for the squaws were the farmers among the aborigines) plowing the ground and cultivating the corn with a crooked stick and a clam shell. Since the days of the Indian farmer there have been many varieties developed. The most important are the Dent corn, grown universally over the southern and western parts of the United States; the Flint corn, grown in New England and other places where the season is too short to mature the larger varieties; the sweet corn, grown mostly for roasting ears and canning; and the popcorn, which is used as a confection.

Let other lands, exulting, glean
  The apple from the pine,
The orange from its glossy green,
  The cluster from the vine;

We better love the hardy gift
  Our rugged vales bestow,
To cheer us when the storm shall drift
  Our harvest fields with snow.—*Whittier.*

CORN SURVEY

It is a splendid piece of work for an Agriculture Class to make a corn survey of its school district, the results of these surveys to be compared with those of other districts in the county. Some of the information gained could, with profit, be published in the local paper, and I am sure the editor of the *Progressive Farmer*, would be glad to receive interesting information gathered in this way. The result of a properly conducted corn survey would be of great value to the school as well as to the farmers. The following form is merely suggestive:

FORM FOR CORN SURVEY.

Date.....

Corn Survey of.....School District.

.....Township, ...County, North Carolina.

.....Teacher, ...Home Address.

Names of Pupils who help in the Survey.....

.....

.....

.....

Farmer's Name	Does He Own the Farm? Where is Farm?	No. Acres Corn	Average Yield Per Acre
Cole, Henry	Yes	30	40 bu.
Cook, H. W.	No, gives crop rent	20	15 bu.
Jones, Jas.	No, gives cash rent	40	20 bu.
Roberts, John	Yes	60	30 bu.
Slow, Sam	No, gives crop rent	15	10 bu.

Total and average	2 Owners.	Number acres	90	33⅓
Total and average	3 Renters.	Number acres	75	16⅔
Total for All			165	25.75+

Let pupils rule blanks similar to the above and fill in as they make the corn survey. In connection with the survey, ascertain the following information:

How did the various farmers *select* and *care* for their seed corn for the last year's crop? Rule blanks and fill in to show when each gathered or selected his seed corn—September, October, November, March, etc.

Where did he store it? In the barn? In the attic? In the cellar? etc.

How did he store it—by tying in strings and hanging it up? By placing it on a corn tree? By keeping it in boxes? etc.

Have blanks also to show whether or not a germination test was made and the result of the same.

Did he count the stand he secured when planting his seed corn in the field, or did he only assume or guess at the stand? Did he replant?

EDUCATIONAL TRAINING OF PRACTICAL VALUE.

Pupils from elementary schools of Johnston and McDowell Counties demonstrating at the State Teachers' Assembly, Charlotte, November, 1914. Many more schools will take part in future demonstrations. Are you giving your pupils as practical training as this?

Give the name of the variety of corn each farmer grows and how long he has grown this variety. Has it "run out"?

Rule the paper both ways, showing a vertical column for each of the above topics. Let the names of the individual farmers appear on the horizontal lines at the left of the sheet.

CORN GROWING

The Means of Motivizing the Study of Agriculture

It is an old, old saying—one that teachers hear continually—but it is a very true saying, this old, old one—"WE LEARN TO DO BY DOING," and nowhere is it more applicable than in the study of agriculture. It is very essential to the study of this subject that pupils really DO something. To actually grow some plant provides the best means of teaching agricultural principles, and gives the best incentive to study. In fact, agriculture should be taught in no other way. A purpose; a need for study; something to awaken and hold the interest; something to call for reasons, and for principles of agriculture; something to drive the lesson home—should precede and accompany the study.

One of the most interesting and most profitable plants to grow is CORN. There are many reasons for choosing corn. It is practical. It is something that any pupil can grow. It is hardy. It is capable of adapting itself to a great variety of soils and climatic conditions. Definite results can be obtained. There is actual profit in growing it, which is a very essential incentive to a *boy*, and also appeals to patrons. The matured corn may be kept any length of time, thus making exhibits practical, and comparisons and rivalry possible. For purposes of instruction it is especially good because it responds well to intelligent management and proves the theories of improving plants by seed selection, fertilization of the soil, proper tillage, etc. All of these things can be demonstrated to advantage. Furthermore, it gives the school an opportunity to serve the community by increasing its productiveness and its wealth, and by arousing an interest in scientific agriculture and in the improvement of farm life conditions. It would be worth while to arouse our farmers so that they would raise enough corn for every possible need on the farm. Corn is the "great American grain food for men and stock upon the farm." It may be made to produce more food per acre than any other cereal and it is generally one of the surest of crops. Because it can be used for both men and stock upon the farm it makes the farmer more independent of market conditions. The financial crisis of the autumn of 1914 would not have affected North Carolina so seriously if so many farmers had not depended upon the one crop, cotton.

THE TEACHER'S DUTY TO THE SOUTH

It is THE TEACHER'S DUTY TO THE SOUTH to coöperate with every agency that is working to stimulate DIVERSIFIED FARMING, to make the farmer independent. Why should we with better climatic conditions than many corn growing states buy corn from other localities at a great expense? The bitter experience of 1914 will make farmers more keenly alive to the necessity of raising a variety of crops. Teachers should make every effort to use the opportunity. Growing corn may be the wedge that will interest the farmer in growing other crops.

GETTING STARTED IN CORN GROWING—BOYS' CORN CLUBS

Then shame on all the proud and vain,
Whose folly laughs to scorn
The blessing of our hardy grain,
Our wealth of golden corn!—*Whittier.*

The first thing to do is to *arouse an interest in corn growing.* There must be a *desire* to grow corn. Boys may be appealed to through the game instinct, the desire to overcome obstacles, to show their ability and to match it against others, to achieve something, to show themselves masters, and to be worthy of recognition among men. They must be shown that their cornfield is not an ordinary corn field, but one with which to play and win a game, to achieve a success. In some cases the appeal may be made through a boy's desire to own something and to actually make money.

The BOYS' CORN CLUB furnishes the best means of stimulating boys to grow corn. It gives boys something in common with other boys; furnishes an opportunity for friendly rivalry; and connects them with a large movement (which is a stimulation in itself); it offers incentives through opportunities to exhibit the results of their efforts, to compete for prizes, and to gain other public recognition of their achievements. Besides this the boy receives the best of instruction and advice.

The teacher should use all of the above means and as many more incentives as possible in her efforts to get all of the boys of suitable age and training to become members of the corn club.*

Professor T. E. Browne, at Raleigh, is the State Agent of the Boys' Corn Clubs. He should be communicated with at once for information regarding the clubs. Arrangements should be made to have him address the school. He is continually traveling over the State, and is fully prepared to give information and advice on any phase of this subject. He is not only able, but willing and anxious to help every teacher and pupil in North Carolina. His presence and address will add enthusiasm and interest, not only for this particular work, but for all the school activities.

The teacher may awaken an interest by telling what corn club boys have done, of the prizes that are offered to the boys, the opportunities of exhibiting at the local and State Fairs. The boys may be shown how they can get more from the soil than has ever been obtained before; how they can get a better price for corn that produces more, and at the same time stand a chance of achieving a recognized success and winning a prize. The average yield in the neighborhood and in the State should be compared with what may be raised, and what has been raised by boys like themselves.

Teachers may send to the United States Department of Agriculture for all bulletins regarding corn clubs (see other references to helpful literature), make a study of them and be prepared to give the pupils an enthusiastic talk. If the pupils are mature enough, they may write for these bulletins and may make short talks to the school on "Corn Clubs, and What Boys Have Accomplished in Corn Growing." It would be well to let *them* write to Professor Browne, and to encourage them, through him, to write to corn club

*NOTE. Every school should also coöperate with Mrs. Jane McKimmon, State Department of Agriculture, Raleigh, in forming Girls' Tomato Clubs.

boys in other parts of the State, and even in other states. They could make interesting reports to the school from what they learned through this correspondence.

The teacher should plan to coöperate with the State Agent and the county farm demonstrator in every way, encouraging the boys, guiding them, assisting them to understand and carry out directions, and to make further studies of corn and agriculture through bulletins and text-books.

Frequent discussion in and out of the class should keep the pupils interested in this work. The teacher should visit each boy and his corn once a week during the growing season. The boys should, if possible, meet once a week at the home of one of the corn growers, choosing a different boy to be visited each week. The treatment of each individual field should be discussed. Topics for discussion at the meetings may be weeds, insect enemies, etc.

COWPEAS AND CORN—OCTOBER.

THE SCHOOL DEMONSTRATION PLOT

In addition to the plot of ground that each boy secures for himself, the teacher should arrange to use the school demonstration farm as a model for the pupils to follow. If the school has no plot of ground, the teacher should arrange to rent one-tenth of an acre on a nearby farm for use to illustrate methods of cultivation, etc. **But no demonstration work should be undertaken by the school unless the teacher, the County Farm Demonstrator, or some other competent and thoroughly reliable person would positively agree to be in the neighborhood and care for the corn during the coming summer.**

HIS PARTNER—THE ACRE OF CORN.

This fine *Corn Field* is the result of a proper mixture of *Corn Club Boy* and *Corn Fed Mule.*

YOUR PARTNER—THE ACRE OF GROUND

For your partner in growing this corn you will wish to select the acre that will do its part to help you gain the prize. It should not be too far removed from a large field of corn because otherwise it might be chosen as a special object of destruction by such enemies as squirrels, crows, grasshoppers, and live stock. Of course your corn should not be near any corn field except that of the same variety, and even then should be planted a little earlier or later so as to not tassel at exactly the same date if you wish to keep it from mixing with the general field. Low land, if not too wet, will usually produce a heavier growth of corn, especially in dry seasons, than upland. Land that has been producing heavy crops will usually do its best for the acre of corn in the contest. This acre partner of yours must be well drained for corn cannot stand "wet feet." It must be fertile and fairly loose to a depth of eight or ten inches.

By studying how the tiny rootlets of the corn make their way through the soil you will realize the importance of choosing the right kind of soil. The point of growth of any root is at the tip. The cells as they divide and grow are very tender, hence they are protected by a hard substance called a cap. This cap is pushed forward by the cells growing behind it. In order to have the plant yield the most corn the roots must have every advantage for doing their best work. The rootlets avoid open and exposed places in the soil, hence the soil must be very fine but not too open. There must be no lumps nor spaces between clods. On the other hand, the soil must not be too solidly compacted, as heavy clay soils are, for then the rootlets make their way with great difficulty. A moist, sandy loam makes an ideal place for the little rootlets to thrive. They can easily push out here and there to gather food for the growth of the stalk and the ear above.

The rootlets must have moisture, but not *too much*. The rootlets can only sip, in the most delicate way, the little film of moisture covering each particle of soil. This film of moisture is called *capillary water*. If there is too much water standing in the soil the little rootlets will drown and soon decay. If too wet the rootlets cannot get the air (oxygen) so necessary for their life. You will remember how yellow the corn looks in some fields where water stands for any length of time. (If possible, visit such a field during the summer.) Water standing thus is called *gravity water*. There is a kind of moisture found in even very dry soil, dry as the dust in the road, called *hygroscopic moisture*. The rootlets are absolutely unable to get this moisture and the corn withers, or, as we sometimes say, comes into distress, if this is the only moisture found in the soil. Rootlets must have a chance to breathe—they must have air. Oxygen is necessary for them to do well—even for them to live at all. The soil is best which can be kept pulverized and loose so that the air will circulate in it, not one that breaks up into large clods or leaves large open places that will let the soil dry out.

The corn rootlets love a warm place in which to work. Even the blistering hot days of summer are their delight—provided, of course, they have plenty of moisture. Here is where a good soil mulch helps. It aids in keeping the moisture in the soil so that the plants can use it.

PREPARE TO FEED YOUR CORN

The roots must find available plant food in the soil. When you burn a stalk or an ear of corn, a weed or a tree, the ashes that are left are a part of the food that the roots gathered from the soil. Study the chapter on "Fertilizing the Corn," found elsewhere in this bulletin.

SELECT ACRE IN FALL, IF POSSIBLE

If the acre plot can be selected in the fall very advantageous preparations can be made. Fall plowing will break up the snug winter house of many an insect enemy and cause the complacent occupant to be destroyed by the inclement weather of winter. It will bring many a noxious weed seed to the surface or place it where it will germinate early in the spring and thus be destroyed by the spring cultivation.

If good crops of leguminous plants, as clover, cow peas, alfalfa or vetch, have been grown the season before and turned under it will be a great help. One reason why these crops help is because they put nitrogen as well as humus into the soil. They also prevent washing and leaching during the winter. When turned under they decay and provide food for the growing corn. Another reason is that they send their roots deep into the soil. This loosens the soil and enables the corn to feed at a far greater depth than it otherwise could.

Study the chapter on "Rotations for the Corn Crop," found elsewhere. For preparing the ground for the next year's crop, at the time of the last cultivation, cow peas or some other cover crop may be sown. A profitable crop of seed may be gathered from the peas by the pupils and the vines can be plowed under when preparing the land for the winter crop of crimson clover.

PREPARING THE ACRE FOR THE PRIZE CROP

Through vales of grass and meads of flowers,
Our ploughs their furrows made,
While on the hills the sun and showers
Of changeful April played.—*Whittier.*

For the best growth of corn there must be the proper amount of heat, air, light, and moisture. The first operation in preparing the soil for the corn is deep plowing. This loosens the soil so that the air, heat, and moisture can enter it. If there was a crop of legumes on the plot plow under and follow the plow the same day with a harrow or a float to pulverize any clods while they are soft and to firm the soil so that it will not lose moisture. This treatment tends to form a mulch of fine soil to prevent the evaporation of moisture. Some authorities recommend disking the soil after plowing. This is fine for pulverizing the soil and firming the plow slice against the

bottom of the furrow so that the moisture will come up into the seed bed. Other authorities recommend using the disk before plowing.

The moist condition of the soil has much to do with the time when plowing and cultivating may be done. It must never be undertaken when the soil is too wet. This is especially true of heavy clay soils. If soil is worked when too wet hard clods will be formed. A good seed bed is impossible with large clods in it, and the clods after they are dry can be pulverized only with great difficulty. If the teacher does not know the best moisture conditions for working the soil, it would be advisable to consult some good farmer in the district. The soil should be moist, yet easily crumbled.

The soil should receive a shallow cultivation just before the corn is planted so as to destroy all weeds that are starting. The corn should have, at least, an even start with the weeds, and it is much easier to cultivate the soil and kill the weeds before than after planting corn.

When the soil has been thoroughly loosened, pulverized, and firmed, it is ready for the corn.

THE TIME TO PLANT THE PRIZE CORN

(*Study Chapter on Seeding.*)

Come, let us plant the corn,
  The bounteous, golden corn!
Select the ears; test life and strength;
  Prepare the bed for seed;
Give food and drink to nourish plants,
  And study every need!

It is better to plant the corn as early in the spring as possible, but not, of course, until the soil is thoroughly warm. There are many reasons for an early start. The boys will take far more interest during the enthusiasm of early spring when they are anxious to work in the soil and see things grow. They like to feel that they are in front of the procession. They want their corn a little ahead of their father's and neighbor's. These are psychological reasons, but they are well worth considering. If possible, it is better to have the planting done before the school closes. It is easier to interest pupils, to keep up enthusiasm, to give directions, and to compare results while the teacher and pupils are together. Early corn does not have the insect enemies to contend with that late corn does. There are, of course, some disadvantages in early planting.

The corn may be planted with a horse planter, hand planter, or by hand. If planted in rows both ways, it is some advantage for cultivation and if the rows are straight, this little field of corn will be very attractive and cause many favorable comments by farmers.

We dropped the seed o'er hill and plain,
  Beneath the sun of May,
And frightened from our sprouting grain
  The robber crows away.—*Whittier.*

THE BEST KIND OF CORN TO GROW

Have a discussion with the pupils about the varieties of corn that have succceeded best in their county; then talk about the soil and other local conditions in the case of each pupil. If he wishes to make all the money he can and has a local market for roasting ears or lives near a cannery, it might be more profitable for him to raise sweet corn. There might also be boys who feel that they can dispose of popcorn to good advantage. If the prospect is good they should certainly be encouraged to undertake the growth of the kind of corn with which they think they can do the best. The most of the pupils will likely choose the field corn that experience has demonstrated to be the most successful near where they live. After reading all the available literature, especially A. and M. College, State Department of Agriculture, and the bulletins issued by the United States Department of Agriculture, and discussing the matter very fully, each individual pupil will decide for himself. The teacher will then be ready for the next lesson, that of selecting the seed.

WIND IN THE CORN

I love to lie in the prairie grass
  As the sun's noon heat is born,
And list to the lisp of the lashing leaves,
  As the wind blows through the corn.
For the sound of the wind is soft and sweet
  As the sigh of a child in sleep;
As soothing and calm as the drifting dark
  That falls from the bluey deep.
It does not moan as it does in the pines,
  Nor wail as it does on the sea,
But sings a song, faint, far, and low—
  A marvelous melody.

—*Will Reed Dunroy.*

[From "The Nebraska Corn Book."]

REPORTS

FROM

North Carolina's Most Progressive Citizens

THE CORN CLUB BOYS

Come, let us till the corn,
The bounteous, golden corn!
Stir well the soil; let roots strike deep;
Drive insect pests away;
Destroy the weeds; then watch the plant
Shoot up from day to day!

The following accounts of Corn Club Boys were furnished by Mr. T. E. Browne, State Agent of Boys' Corn Club work, A. and M. College, Raleigh, N. C.

HOW I PRODUCED 235 BUSHELS OF CORN ON ONE ACRE

C. W. Parker, Jr., Woodland, N. C.

In the spring of 1909 I selected an acre of land upon my father's farm to plant in corn for the Hertford County Boys' Corn Club Contest. I plowed the land 10 inches deep, having previously spread broadcast ten wagon-loads of stable manure. I then ran off the rows 4 feet apart, listed same two furrows to each row, about the 15th of April. The 1st of May I planted the corn—Biggs and Honeycutt varieties mixed. I used $9.50 worth of fertilizer, one-half used in drill when planted and the other half used beside the corn at the second cultivation. The fertilizer used was 16 per cent acid phosphate, cotton-seed meal, and kainit in equal parts.

We had excessive rains throughout May, June, and the first of July, which drowned my corn, and its yield was only 67½ bushels, which won first county prize. The entire cultivation was done with a five-hoe cultivator and Climax cotton plow run very shallow.

In December, 1909, I selected an acre of land in the same farm, spread broadcast eight wagon-loads of stable manure and bedded the land up, breaking same 12 inches deep. I then took wing off of plow and ran two furrows in the bottom of the row between the corn beds from 8 to 10 inches deep.

About February 1, 1910, I reversed the beds, breaking same from 12 to 14 inches deep, and ran two center subsoil furrows, 8 to 10 inches deep, between the beds, as in December.

I opened the beds the 25th of April and planted corn about 6 inches below the level of the bed, using in the same furrow 400 pounds of cotton-seed meal, acid phosphate, and 2-8-2 guano mixed in equal parts. I used the "Biggs seven-ear corn," planted with a Centennial planter. As soon as the corn was large enough to cultivate I used the five-hoe cultivator. At the second cultivation I used 100 pounds of nitrate of soda in a shallow furrow beside the corn and split middle with five-hoe cultivator. About ten days later I used 100 pounds of nitrate of soda in the other row, used as stated above, which was the last cultivation. I gave the corn two thorough cultivations with five-hoe cultivator and two with cotton plow, running very shallow each time.

I planted the corn 18 inches in the drill, two to four grains in each hill, and harvested 132½ bushels of corn, which was the largest yield in my district. I had what I considered ideal seasons, and found that I made a big mistake by planting my corn too far apart in the drill and two few stalks in the hill. Therefore, I resolved to try to plant 1911 crop thicker in the drill and have my rows 3 feet 10 inches apart, instead of 4 feet, as in 1909 and 1910.

On this 1910 acre I won the first district prize given by the State Board of Agriculture, which was $25; the first county prize, a runabout buggy given by the Hines Buggy Company of Murfreesboro, and a King weeder given by the *Progressive Farmer* contest.

In December, 1910, I selected an acre of land upon which my brother had gathered 126.5 bushels of corn, this being the acre used by me in the 1909 corn contest.

I hauled out 10 wagon-loads of stable manure and spread it broadcast over the land; bedded it some 12 to 14 inches deep.

About February 1, 1911, I reversed the beds, plowing the same depths as stated above, and ran deep furrows between the beds as before. March 21st I listed the land with two-horse plow, two furrows to the row, 12 to 14 inches deep, and leveled it with a disc harrow as deep as I could.

I then broke the land about 12 inches deep with a two-horse plow, followed behind in the same furrow with subsoil plow 6 to 8 inches deep, making total depth of breaking about 18 inches.

I ran off my rows with a cotton plow 3 feet 10 inches apart, and on the first day of May I planted "Biggs seven-ear corn" 6 inches apart in the drill, 3 to 5 grains in each hill, with a Centennial corn planter. I used $9.15 worth of fertilizer, including 200 pounds nitrate of soda. I put all fertilizer in drill under corn when planted except the nitrate of soda. One hundred pounds of this was sown broadcast about the first of June and harrowed in with an iron-tooth harrow.

Up until this time there had been only one good rain since the corn was planted. The weather was so dry for the next four weeks my corn began to parch, and about the 15th of July my neighbors said I would not make as much as I planted. About the 20th of July we had fine rain and cloudy, damp weather for several days. Then I scattered 100 pounds more of nitrate of soda between the rows as a top dresser. The corn at this time had blown down so badly I could not cultivate it any more, and it was really difficult to walk through it. However, I have carried out the instructions and methods advocated by the Farmers' Coöperative Demonstration Work, with the exception of doing the subsoiling in the spring instead of the fall. After the corn was planted I did not use any implement in the cultivation except the harrow and light cultivator running very shallow.

I am happy to say that the result was the largest yield ever known to this section, 235.5 bushels field measurement, making 195 bushels of dry shelled corn. I am satisfied that it is possible to grow 250 bushels of corn on one acre of land, and I propose to work toward this end in 1912. If all the farmers in North Carolina would follow the demonstration plans our State would have plenty of corn to sell to our Western farmers at a handsome profit the year around. My corn only cost me 24 cents per bushel, which shows the yield was the result of good methods, and not the extravagant use of commercial fertilizer.

HOW I GREW MY ACRE OF CORN

BENJAMIN S. MCKEEL, Walstonburg, Greene County, N. C.

The land on which I grew my corn this year (1913) is gray soil about 8 or 10 inches deep with yellow soil 8 or 10 inches under the gray, with a red clay foundation. I sowed oats in 1912 about the middle of March. In June, after the oats were cut off, it was sowed in peas and the oat stubble was plowed under and 500 pounds of 16 per cent acid phosphate was sowed broadcast over the land, after which two bushels of red peas were broadcast and harrowed in, which gave me the finest crop of peavines I ever saw. They were cut off in the fall about the 1st of October for hay. February 1st I hauled four two-horse wagon loads of stable manure. It took me three hours to load the

A NORTH CAROLINA DEMONSTRATION AGENT TEACHING A CORN CLUB BOY TO PICK THE WINNERS FOR NEXT YEAR'S RACE.

manure and three hours to haul it. February 22d I broke my land with a one-horse plow about 8 inches deep, which took me 7 hours. April 14th I spent 8 hours preparing a seed bed. I ran the rows five feet apart, bedded my land four times to the row very deep. I then made a small ridge between the beds to plant upon. On April 15th I planted my corn with a "Ledbetter" corn planter, which took me one and one-half hours.

On April 29th I replanted my corn. It was very dry weather and there were a few gaps in it. This took me two hours. On May 14th I took a turning plow and laid it off, which took me three hours. May 22d I sided my corn, running in the same furrows I made when I laid it off. There was still not much dirt to it. May 30th I thinned my corn, leaving it about 7 or 8 inches apart, some was a little further. It took me two hours. June 2d I plowed out the middles with a turning plow. It took me three hours. June 17th I sided my corn, sowed fertilizer on each side of the row, split out the middles with three furrows. It took me five hours to do the plowing and four hours to sow the fertilizer. I used 400 pounds Farmers' Bone Guano—8-2-2, cost $3.60; 200 pounds 16 per cent Kainit, cost $1.40; 100 pounds C. S. Meal, 7½ per cent, cost $1.50; well mixed.

HOW I GREW MY CORN

J. R. Cameron, Kinston, N. C., R. 1.

On January 15, 1913, I broke my acre eight inches deep with a two-horse turn plow, then spread four two-horse wagon lods of barn-yard manure. On March 10th I rebroke the acre fourteen inches deep with a two-horse turn plow, followed by subsoil plow; then spread seven two-horse wagon loads of barn-yard manure and cut the acre each way with a disk harrow.

PLANTING.

I opened the furrow with a Stonewall plow six inches deep, laying off rows eighteen inches apart, alternating every other row fifty-four inches apart, making a wide and narrow middle. Then I distributed in the furrow four hundred pounds of 11-5 bone and potash mixture, and made a very small list, using Cole planter with six inches plate, planting three inches deep and leaving top of list three inches below the surface.

On April 10th I spread six two-horse wagon loads of barn-yard manure, then ran two-horse smoothing harrow, dragging it in. On May 9th, I ran a weeder over the corn and sided with a Cotton King Harrow. May 15th, sided with a Stonewall plow equipped with small fixtures. On May 22d I sided with a Stonewall plow equipped with medium fixtures and side dressed in wide rows with two hundred pounds of 7-4-5 mixture. On the 23d of May I burst out wide middles with a turn plow, two furrows to the row. On the 28th I sided with a Stonewall plow equipped with large fixtures; side dressed each row with two hundred pounds of 9-3 top dresser prepared by the A. A. C. C., Baltimore, Md., then I burst out the middles very shallowly with Stonewall plow and laid by the corn.

Fodder was left on the stalks. On November 6th I commenced gathering my corn and completed it on the 12th. I weighed and measured my corn and it amounted to 190.4 bushels.

On July 9th I sowed on the side of each bed, about 12 inches from the stalk, nitrate of soda. I used 128 pounds which cost me $3.50.

This is about the full story of how I cultivated and grew my corn. The nitrate of soda that I used as a top dresser, July 9th, did fine. My corn never fired at the bottom like other corn I saw. The kind of corn that I planted was Biggs' Prolific, that we have improved. This is the fourth year that my uncle has been planting the corn and it gets better every year. The storm in September blew it down this year, so we did not get to select the seed for next year from the field. Will have to select from the barn.

HOW I GREW MY ACRE OF CORN

E. C. Morgan, Marietta, N. C.

About the 1st of February, 1912, the land was heavily broadcasted with rough manure and broken deeply. The land was planted in cotton and produced about one and a half bales per acre. About January 1, 1913, cotton stalks were cut and the land was disked two ways with 16-inch disk harrow, after this the land was double broken with Dixie plow by going twice in the same furrow, the land was broken about 14 inches deep at this plowing.

About the 15th of February land was bedded in 4-foot rows; later ran one time in bottom of furrow with small scooter as deep as a 1,000-pound mule could pull it. Two small furrows were thrown back and corn was planted with a P. & O. corn planter, 10 inches apart. Was planted on or about March 26, 1913. I did not put any fertilizer down at the time corn was planted. About May 1st corn was plowed with a 12-inch sweep, both sides. About May 10th one side was plowed with 14-inch sweep and about May 15th the other side was plowed with same sweep, very shallow. About May 25th one side of corn was cultivated with a 16-inch sweep and three or four days later other side was plowed with same sweep. On June 1st one side of corn was barred with Dixie plow, small wing on, and in this furrow was sown 400 pounds of fertilizer per acre. This was a mixture of 100 pounds kainit, 100 pounds acid and 200 pounds C. S. meal. As soon as the fertilizer was sown corn was plowed with 18-inch sweep and the middles burst shallow with same sweep. In about five days other side of corn was worked in the same way. About June 15th one side of corn was laid by with a 20-inch sweep by going three times to the row. About June 20th 100 pounds nitrate of soda was broadcasted in the other row and it was laid by with a 20-inch sweep, same as the other side. The last cultivation was very shallow and the land was left nearly level.

I harvested 127.8 bushels of corn from my contest acre, at a cost of $16.55 or 13.5 cents per bushel.

GIRLS AS WELL AS BOYS CAN GROW CORN.

Miss Lipe won not only a County, but a District, Prize with her fine Corn, in 1912.
R. L. Lipe, her father, is County Demonstration Agent,
Richfield, Stanly County, N. C.

A NORTH CAROLINA BOY'S EXHIBIT OF CORN.

The Club Boys are taught how to select as well as raise good corn.

LEARNING TO JUDGE CORN, OR THE USE OF THE SCORE CARD

Come, let us note the corn,
The bounteous, golden corn!
Behold the leaves, its tassels, ears,
Produced from sun and sod!
The corn created! What a joy
To thus have worked with God!

We have taken considerable space for this subject because every boy and every farmer who raises corn should be told how to choose with intelligence those ears of corn which will yield him the most bountiful harvest.

A short chapter has been taken from "The Book of Corn." This is done because it explains so fully the use and meaning of the score card. Also short score cards are given from "Elements of Agriculture," and from "Productive Farming." These will serve to show that, while there is a slight difference in the form of the score card used in different places, the object of all is the same. For this and all other information and help the teacher and pupils are reminded that Prof. T. E. Browne, of the North Carolina Department of Agriculture and A. and M. College, who has charge of the Boys' Corn Club work, is the very best source.

CORN JUDGING.

(From "The Book of Corn.")

The great object which the judge has in mind is to select that sample of corn for first place, which, in his estimation, is best for seed purposes, namely: which will, if planted next spring, give the greatest profit per acre in the district in which it is grown.

There are a number of things which the judge takes into consideration in scoring or marking the samples. In the first place the samples will be laid side by side on a table or long plank so that they can be studied carefully and compared. Two or more kernels are taken out of each ear and laid at the tip of their respective ears with the germ or chit side up. In case there are any poor samples which, for any reason, stand no show of winning they are laid to one side without spending any more time upon them. The judge then scores the remaining samples, taking up one at a time, and marking each sample what he thinks it deserves on this particular point and so on until the samples have been marked or scored on all the different points. The score for each sample is then added and the one with the highest score receives first place, and the next highest second place, and so on.

History of the Score Card. There are certain general points in all varieties of corn which must be taken into consideration by the judge and the breeder. This has led to the formulation of these general points in a so-called score card. In this standard of perfection for corn the corn growers have given the different points in ear of corn their proper degree of importance. It is an invaluable guide to the judge in keeping in mind during judging a proper sense of the proportional importance of the general points, so that peculiar characteristics are not given undue importance. A score card for corn was first formulated by the late Orange Judd and was recently modified and revised by the members of the Illinois Corn Growers' Association. This lead was immediately followed by other score cards made by the corn growers' societies of other states. At present there are several in existence. Further

changes will doubtless be made in the score card, adapting it to future requirements.

VARIETY STANDARDS.

Each particular variety has its characteristic shape, etc., which must be known by the judge in order to properly pass upon the exhibit. Further, each variety has its peculiar length, circumference, and proportion of corn to cob. These points, determined by a careful study of the best samples of the different recognized varieties, are as follows.

	Length, Inches	Circumference, Inches	Per Cent Corn to Cob
Leaming	10	7.0	.88
Boone County White	10	7.5	.86
Silver Mine	9	7.0	.90
Reid's Yellow Dent	10	7.0	.88
Riley's Favorite	9	7.0	.90
Golden Eagle	9	7.0	.90

PRACTICAL JUDGING HINTS.

In judging corn, it is the custom to use ten ears for a single sample. This number furnishes the most simple and easy calculation, and has been adopted as the standard number for all exhibitions. It is very desirable that the exhibits be so arranged that the samples can be laid out side by side on a table with a few inches of space between each sample. It is convenient for the judges to work on a table about three feet high and it is imperative that there be a good light on all sides of the samples. The samples shall be handled as little as possible during judging, care being taken that no kernels be knocked off by careless dropping of the ears. Any kernels that are missing are usually regarded as mixed and the usual cut made for such imperfection. However, it is allowable in selecting a sample for an exhibit to remove two kernels from near the middle of the ear for the purpose of studying the shape, size and general characteristics of the kernels. Danger of injury can be avoided in shipping by carefully wrapping each ear in paper or other protection, and packing the ears firmly in a shipping box.

Corn should never be sent to any exhibition in a basket or bag, as there is always danger of damage from careless handling. It is always allowable and perfectly proper that the exhibitor take special pains in preparing the exhibit for the judge. All silks and shanks should be carefully removed and the ears groomed so as to present the best possible appearance. However, it is not allowable to mutilate or cut the ear itself in any way. Any ear with the protruding tip cut off should be cut to the limit, as the presumption is that the tip was very poor or it would not have been cut off. Neither is it allowable to remove mixed kernels and substitute kernels of proper color. Changes of this sort can usually be detected by the expert judge, and a full cut for color of that ear should be made.

The shape and other characteristics of ears will vary with every variety. It is the function of the expert judge to know the variety characteristics and to score accordingly.

HOW TO STUDY THE EXHIBIT.

Shape. The shape of the ear should conform to the variety type. With most of the varieties it is important that the ears should not be too slender nor taper too rapidly, as this indicates weakness or lack of constitution; rather have the ears full in the middle, carrying their size well to the tip, rounding over quite rapidly. This shape allows the development of uniform kernels from butt to tip and usually results in a large percentage of corn to the cob. However, the characteristic Leaming ear is partly cylindrical for part of its length at butt and then slowly tapers to tip. This is usually the result of dropping two or more rows of kernels, about one-third the distance from butt to tip. In the Leaming variety this characteristic shape is not particularly objectionable and no cut should be made for such a condition. Another objectionable shape is the tapering ear, which begins to taper at butt and runs out to a sharp-pointed tip. Such shape is always objectionable from the fact that the butt kernels are large and the tip kernels are very small, usually the case in an ear with a small percentage of corn to the cob. The exhibit showing the best variety shape should be given the full number of points.

Uniformity. A uniform exhibit means a sample, all of the ears of which have the same size, shape, type and general characteristics. This is one of the most important points in the score card. A uniform exhibit shows good breeding, while an irregular exhibit shows poor selection. In judging uniformity the characteristics of the ear must be taken into consideration. The indentation of the kernels, color and straightness of rows must be particularly taken into account. The rows should be parallel from butt to tip. If they are crooked, or, as is frequently the case, turn to the right or left in a spiral manner, a proper cut should be made. The most simple way for the judge to deside upon the marking for uniformity is to push out all irregular ears and then decide upon the cut to be made from the proportion of uniform to the non-uniform ears.

SCORE CARD FOR CORN AND EXPLANATION OF POINTS.

	Points.
1. Trueness to type	10
2. Shape of ear	10
3. Color (a) Grain	5
(b) Cob	5
4. Market condition	10
5. Tips	5
6. Butts	5
7. Kernels (a) Uniformity of	10
(b) Shape of	5
8. Length of ear	10
9. Circumference of ear	5
10. Space (a) Furrow between rows	5
(b) Space between kernels at cob	5
11. Proportion of corn to cob	10
Total	100

TWO CORN CLUB BOYS READY FOR BUSINESS.

RULES TO BE USED IN JUDGING.

1. *Length of Ear.* The deficiency and excess in length of all ears not conforming to the standard shall be added together, and for every inch thus obtained, a cut of one point shall be made.

2. *Circumference of Ear.* The deficiency and excess in circumference of all ears not conforming to the standard shall be added together, and for every two inches thus obtained, a cut of one point shall be made. Measure the circumference at one-third the distance from the butt to the tip of the ear.

3. *Proportion of Corn to the Cob.* Per cent of corn should be from 86 to 87. In determining the proportion of corn to cob weigh and shell every alternate ear in the exhibit. Weight the cobs and subtract from the weight of the ears, giving the weight of the corn. Divide the weight of the corn by the total weight of the ears, which will give the per cent of corn. For each per cent short of standard a cut of one and one-half points shall be made.

4. In judging corn, a red cob in white corn or a white cob in yellow corn shall be cut at least two points. For one or two mixed kernels a cut of one-fourth point; for four or more mixed kernels, a cut of one-half point shall be made. Kernels missing from the ear shall be counted mixed. Difference in shade or color, as light or dark red, white or cream color, must be scored according to variety characteristics.

5. *Exposed Tips.* Where the full diameter of the cob is exposed, a cut of one point shall be made and a proportionate cut as the cob is less exposed. Regularity of the rows near the tip, and the size and shape of the kernels, must also be considered in scoring tips.

6. *Scoring Butts.* If the kernels are uniform in size and extend over the butt in regular order, give full marking. Small and compressed or enlarged or open butts are objectionable, as are also those with flat, smooth, short kernels, and must be cut according to the judgment of the scorer.

7. Each exhibit should consist of ten ears of corn.

Color. The color should be either a pure yellow with a red cob, or a pure white with a white cob. A white cob in a yellow sample should bar the exhibit. It indicates very poor breeding. In many cases individual kernels are tinted, the yellow with the white and the white with yellow in color. In this case it shows that a single stray pollen grain has fallen upon a single silk and fertilized the kernel. It is of little detriment to the variety and should be judged accordingly. A rule followed by many expert judges is to cut one-fourth point for two, one-half point for five, three-fourths point for seven and one point for ten or more mixed kernels. A white ear or cob tinted with yellow or a yellow ear tinted with white must be cut according to the judgment of the scorer.

Tip. The tips of the ears should not be too tapering and should be well filled with regular, uniform kernels. Where the full diameter of the cob is exposed, a cut of one point should be made and a proportionate cut as the cob is less exposed. Regularity of the rows near the tip and the shape and size of the kernels must also be considered in scoring tips. The failure of an ear to have the tip well filled may be due to several things, first and most

generally, to the fact that the silks are not all ready for pollenization during the period when the pollen is ripe. For example, in the case of a very late ear of corn, the tip may not be well filled because the tip silks ripen too late for pollenization. The filling of the tip is also influenced by the season. If the season is unfavorable because of an excessively wet period during which time the pollen is washed away, or in case of excessively hot winds or a very dry spell during pollenization, the pollen often is destroyed before it has time to completely fertilize the ear. In such seasons and under these circumstances very many ears may be poorly filled. It is desirable that any variety be so bred that all parts of the ear mature in time for the pollen to fully fertilize them. When conditions are favorable, doubtless this may be accomplished by the breeder selecting for seed only those ears which are well filled out over the tips.

Butt. In a well filled butt the kernels should stand out about the shank so that when the ear is broken from the shank a small hollow is left. This assists in securing a large proportion of corn to cob. Not only is this true, but a poorly filled butt is usually accompanied by a large shank. This large, strong shank makes it very difficult for the ear to be broken off during husking, an undesirable quality in any variety. On the other hand, if the butt is very small the shank supporting the ear on the stalk may become so weak that it cannot hold the ear securely and the result will be that the ears will be too easily blown off during wind storms.

Circumference. In measuring the circumference of an ear, pick up the ear in the left hand, holding the tape line in the right. Press the forefinger of the left hand on the end of the tape and with the right hand bring the tape line around the ear. Keep in mind the deduction in scoring each ear as every ear is measured, and, when through measuring, subtract the total cut from five, in this way getting the marking for circumference. The circumference is usually measured about one-third distance from the butt to tip, because this seems to be the most constant point in all ears. If there are any rows dropped or if any other irregularity is present, it usually begins about this point in the ear.

Length. In measuring the length the most simple and satisfactory plan is to hold the rule in both hands so that the left hand near the butt of the ear can guide the measurement. Have a rule or tape at least twelve inches in length, as many ears are that long. By holding the thumb of the right hand at the eleven-inch mark, or whatever length is the standard, and running the rule over all the ears, a quick measurement can be made. The judge should keep in mind the number of inches every ear is short of the standard, and by adding these measurements the total deficiency is found.

Ripeness. The ripeness indicating maturity is largely a matter of judging and no set of rules can be given for the guidance of the judge. Ears that are not sound and dried out; that are not firm, and which, when violently twisted do not give a crisp, rasping sound should be given a full cut. An ear on which the rows of kernels are loose, and in which a knife blade can be stuck down between the rows, is immature. Frequently the kernels are very deep and have especially deep indentations. If this be carried too far, the kernels will not fill out or mature properly and a chaffy ear will result. This

condition should be taken into consideration under this head. If there are any rotten or immature kernels in an otherwise fairly well-matured ear a proportional cut should be made.

Kernel Shape. The shape of kernel varies with the different varieties. Every variety has a characteristic shape of kernel, but in general there are certain conditions of shape that all kernels must fill. Such kernels fit around the cob tightly and do not leave a space at the tip near the cob nor a deep furrow between the rows of kernels. If the kernels are square they will angle and a space or furrow between the rows of kernels will result. A broad, square kernel is usually shallow and only a few rows of kernels grow on each cob. This means a small percentage of corn to the cob. On the other hand a well shaped kernel is usually found on an ear with a large number of rows of kernels and results in a large percentage of corn to cob. The sides of the kernels should be straight. In some varieties the kernels are broad and shallow and there are only a few rows of kernels on the ear. This sort of kernel is the flinty type and is early maturing. In judging the shape it is a good plan to take out two kernels from each ear from about the middle of the ear and lay them out in front of the ear with the tip of the kernel toward the judge. Push out in a separate row the ill-shaped kernels and determine the marking by the proportion of well-shaped kernels.

Kernel Uniformity. The uniformity of kernels can be determined largely by an examination of the ears. The kernels should be of the same size in all parts of the ear with the exception of the egg-shaped rounded tip. The kernels of the different ears should be of the same size and have the same general character of indentation. The marking on this point is largely a matter of judgment and cannot be guided by any set rule.

Space between rows refers to the furrows formed by rounding off of the tops of the kernels. It is not, as is generally supposed, the space found on immature ears where the rows of kernels are loose. The ear with space is usually firm and well matured, but the peculiar rounded crown of the kernel causes the furrows. It is indicative of poor breeding, and is usually found in ears having but few rows of kernels. These kernels are usually shallow and broad, and rounded at the corners. Such ears always yield a comparatively small percentage of corn to cob.

Proportion. In determining the proportion of corn to cob, it is the usual custom to select every other ear, making a total of five ears to be weighed. After weighing, shell these ears carefully so as not to break or injure the cob. Then weigh the cobs and subtract this weight from the weight of the five ears; this will give the weight of shelled corn. Divide the weight of shelled corn by the weight of the five ears, which will give the percentage of shelled corn.

Before the individual samples have been shelled, it is advisable to pick out the ten samples scoring the highest, lay them side by side and carefully go over them again in order to get a careful comparative study. This will enable the judge to pick out the best sample with confidence, and is always much safer than to trust to the individual scoring. In fact it is true that the expert judge soon learns to do away with any hard-and-fast lines in scoring corn.

SCORE CARD FOR DENT CORN.

(From "Elements of Agriculture.")

	Points.
Maturity and market condition	20
Seed condition	20
Shape of kernels	20
Uniformity	15
Weight of ear	10
Color of grain and cob	5
Length of ear and proportion	5
Butts and tips	5
Total	100

SCORE CARD.

(From "Productive Farming.")

	Points.
Trueness to Type or breed characteristics	10
Shape of ear	10
Purity of ear (a) grain 5, (b) cob 5	10
Vitality or seed conditions	15
Tips	5
Butts	5
Kernels (a) uniformity 5, (b) shape 10	15
Length of Ear	5
Circumference of ear	5
Furrows between rows	5
Space between tips of kernels and cob	5
Proportion of corn to cob	10
Total	100

TESTING THE VITALITY OF EARS OF SEED CORN

PREPARING THE TESTER.

It is very important to know before planting whether or not seed corn will grow if given an opportunity. It has been demonstrated that the fertility of the entire ear of corn is fairly uniform, viz., if representative kernels of one part of an ear have good fertility it is fair to conclude that all the other kernels on this ear also have good fertility. This makes the testing of seed corn quite easy because it requires only a comparatively small number of ears to plant even a large field.

In preparing the test, use any shallow box about 3 or 4 inches deep and two or three feet for the other dimensions. It would be splendid practice for the boys to make one of these boxes for the school. Fill the box to within about an inch of the top with sawdust, clean sand, or even with soil. Take a piece of white muslin a little larger than the box and mark it off with pencil into 2 inch squares, or as many spaces as you have ears of corn to test. It is customary to use one hundred ears, but this should be guided by the

amount of seed corn needed. Leave a margin of 3 or 4 inches around the edge of the cloth. Begin at the upper left hand corner and number the squares toward the right 1, 2, 3, etc. Moisten thoroughly the sawdust and firm it down well. Place the cloth with squares marked on it in the box on the sawdust. Fasten it to the sides of the box, after placing the kernels on the squares, as indicated. Over this spread a piece of plain muslin without marks.

PLACING SEED IN THE TESTER.

Place the ears to be tested in a row where they will not be disturbed. Number the ears of corn to correspond with the numbers in the germination box. These numbers should be attached to the corresponding ears of corn.

THE RESULTS OF TEST OF FIFTEEN EARS OF CORN.

Ears 2, 6, and 9 are entirely dead; ears 3, 4, 7, and 8 are particularly vigorous.

Courtesy of Professor P. G. Holden. From Kyle & Ellis's "Fundamentals of Farming and Farm Life." Reproduced by special arrangement with Charles Scribner's Sons, Publishers.

Great care should be taken that the numbers shall not be separated from the ear.

With a knife carefully remove six kernels from each ear. They should be from six different places on the ear—two from near the tip, two from near the butt, and two from near the middle of the ear. No two kernels should be taken from the same row. Place the kernels from ear No. 1 in square No. 1, from ear No. 2 in square No. 2, etc. The kernels should be laid with the germ side up and the tips all pointing the same direction. Cover with unmarked muslin. Over this lay any coarse cloth to keep the moisture from evaporating. Keep the box warm (about the temperature of the school room). If the box is well wrapped, especially with paper, it will not freeze even if left in the schoolhouse during quite cold nights. In removing the cloth to see the corn be careful not to disturb the corn. The corn will sprout in 4 to 6 days. The corn should be allowed to grow for several days to see how vigorous a growth the young plants make. No ears should be used for seed unless all the kernels from that ear respond with a vigorous growth.

TESTING EARS OF SEED CORN AT HOME.

As soon as the germinating box at the school is finished and the corn placed in it, the children should be encouraged to test their seed corn at home. This should be done while the interest is keen in the one at school. The teacher and members of the agriculture class should visit the homes and see each student's tester and how his corn is growing. This will stimulate the interest of the entire school and lend something of the spirit of emulation to the work. The parents will take an interest in the work of their son if they know that the teacher and his class are coming to see the results of the boy's efforts. The coöperation of the school and home is most important.

REPORTS ON THE HOME TESTING OF SEED CORN.

As soon as the tests are well started at home the individual members should begin to report to the class. These reports and the discussions of the class will be very interesting and profitable. This will be especially true if the teacher and the members of the class visit the different homes, as previously suggested. Every member of the class should be encouraged to test some corn for his father to use as seed in his regular farm crop, and, of course, the boy will want to test the corn he is to use on his own prize acre. Let each pupil bring to school some of the ears he has tested at home. Without letting the class know the home record of these particular ears, have the class test them and see how the different tests tally. Let pupils exchange ears in the same way and check each other's work. Compare tests with the germination box and the rag doll on the same ears. Impress again upon the pupils the importance of discarding all the ears except those that show the very best vitality and promise the most vigorous growth. Show the pupil that if he were intending to run a race he would not start behind the others with whom he was to run, nor would he handicap himself by any extra weight that he was to carry. He has his plot of ground and is racing with his competitors trying to get *every possible bushel of corn from the land. This is the real test.* Incidentally he may be trying to raise more corn than some other boy. There is not a foot of his land to be wasted by growing weak stalks or no stalks at all because of his planting poor seed. The boy's father, the farmer, has no land nor time to waste by cultivating land from which he gets no returns, nor even small returns.

But let the good old crop adorn
The hills our fathers trod;
Still let us, for his golden corn,
Send up our thanks to God!—*Whittier.*

THE RAG DOLL CORN TESTER.

Another simple and effective method of testing ears of seed corn is to use rolls of cloth called "rag dolls." Take strips of white cloth about ten inches wide and five or six feet long, hem the edges to prevent raveling, draw a heavy pencil line lengthwise down the middle of each piece of cloth, mark across the cloth so as to divide it into spaces about 3 inches wide (see illustration), number the spaces leaving about one foot at the end of the cloth

DON'T YOU WISH THAT THE PEOPLE, OLD AND YOUNG, IN YOUR SCHOOL DISTRICT HAD AS VITAL AN INTEREST IN SO VITAL A SUBJECT?

Tabulating results of Rag Doll seed corn tests by pupils of a Cook County, Ill., rural school.

Kindness of "Kimball's Dairy Farmer," Waterloo, Iowa.

that is not numbered. Wet the cloth and spread it out on the table, lay the kernels on the numbered spaces, the same as described for the germinating box. When the cloth is filled roll it up carefully and tie each end loosely with a string or use a rubber band. Number the rolls and use as many rolls as necessary. Stand the rolls in a bucket of warm water for a few hours with the tip ends of the kernels down. Take them out of the water, let them drain, stand where they can be upright and cover so they will not dry out. They must, of course, have some air. In six or seven days unroll carefully and be sure to separate the ears that show strong germination from those that produce only a weak growth. The rag doll tester is cheap, easily made, may be carried from place to place and shows all parts of the germinating plant. If it is feared that the schoolhouse may get too cold from Friday night until Monday morning, the rag dolls can easily be carried home by some of the pupils. If it is desired to use the cloth for another test it should be thoroughly boiled to destroy the mold and otherwise to disinfect it.

SHELLING AND GRADING THE SEED CORN.

After the ears of corn have been selected and thoroughly tested, the ears should be carefully shelled by hand. In this way all imperfect and dead kernels can be rejected. There is, of course, no room in any corn field for dead seed, and least of all in the field of a boy who is trying to grow a prize acre. The unusually small kernel will not have enough vitality and plant food to make the strongest and most vigorous growth. They can be separated by shelling the corn into a coarse sieve. The extra large and irregularly shaped kernels make it almost impossible for the corn planter to plant the same number of kernels in every hill; hence all irregular and under- and over-sized kernels should be removed.

A BOY'S HARVEST.

And now; with autumn's moonlit eyes,
Its harvest time has come,
We pluck away the frosted leaves,
And bear the treasure home.—*Whittier.*

TESTING SHELLED SEED CORN.

If possible, the seed corn should have been selected in the field soon after the corn was ripe. (See lesson on Field Selection of Seed Corn.) But if no provision was made for selecting seed corn in the field it must be secured in the spring. Insist that the seed shall be on the ear, if possible. In this case, test the seed according to the plan above. If, however, it is absolutely necessary to use shelled corn, secure it of as a reliable dealer as possible. Examine the corn for broken kernels and make the following test:

Lay a piece of moist blotting paper on a plate, take one hundred kernels just as they come, lay them on the moist blotting paper; they should now be covered with a piece of paper over which is laid a moist blotting paper, or moist piece of cloth, cover with a piece of glass or inverted plate, keep moderately warm and moist, remove germinating kernels from time to time, and by keeping a record it will give the per cent of good and poor seed. This is a useful exercise for the pupils to try even though they have another source for their supply of seed corn.

EXPERIMENTS

TO SHOW WHAT EFFECT DEPTH OF PLANTING HAS ON THE GROWTH OF THE SEED.

Fill a wide mouth bottle, 6 or 8 inches high, or a quart glass jar with fine garden soil, or even with fine sand, to a depth of one inch; then lay in a grain of corn, germ side next to the glass, with the tip of the kernel downward. Fill in another inch of soil and place another grain of corn as before. Continue to place them one inch apart until within a few inches of the top; then place them every half inch. Do not fill the bottle quite full of soil. Arrange the grains spirally from bottom to top. Be careful in moistening the soil to not let water run down over the grains of corn as it will wash dirt between them and the glass so that they cannot well be seen (see figure). Keep a record of the growth of different kernels and the depth at which they are planted and it will soon be seen that there is a certain depth at which to get the best results.

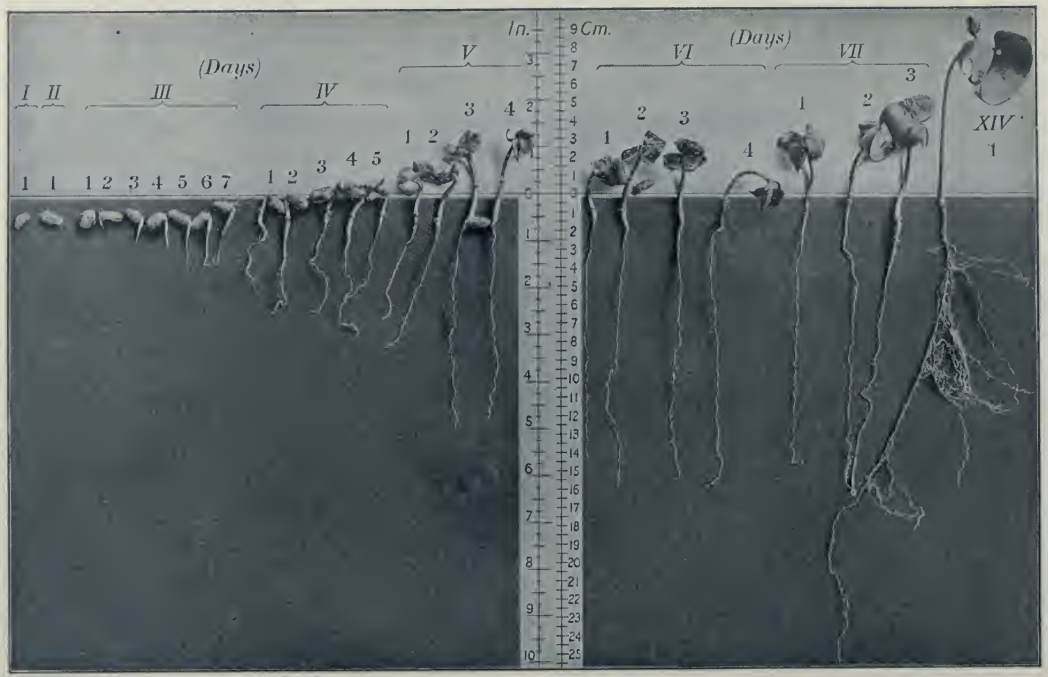
TO SHOW THAT PLANTS MUST HAVE AIR IN ORDER TO GROW.

Secure two wide mouth bottles or two glass fruit jars, fill one with ordinary well water and the other with the same kind of water, except that the water in the second jar has been boiled for several minutes. Immediately after boiling the water to expel the air, pour it into the jar and cover it with oil so that it cannot absorb air. Now thrust some cuttings of common house plants such as geraniums, wandering jew, fuchsias, etc., or oak, willow, poplar, and cotton wood into each jar and note how soon roots are formed in each jar.

STUDYING THE BEGINNING OF THE CORN PLANT.

It is a matter of interest and real culture for the pupil to cultivate the acquaintance of the young plant in its start on the journey of life. Soak grains of corn, squash, or pumpkin seed, beans, peas and melons, or other large seeds in water over night. Be sure to have enough seeds of each kind so that every pupil may have at least three or four seeds. Examine the seeds to discover their different parts. Cut several cross sections of a grain of corn. Cut the grain of corn lengthwise through its narrowest way. Cut a longitudinal section through its broadest way. Notice the yellow, oily part called the germ. Test the beans, squash, and other seeds in the same way. Make drawings of each seed, naming its principal parts. Write descriptions of the different seeds. Place some of the corn and other seeds in the box or in the rag doll tester. Make drawings each day for ten days to show the development of the different parts of the seed.

In a box of clean sawdust or sand plant corn, beans, squash, etc., as before. Keep the sand moist and warm. After the end of ten days carefully dig up one plant of each kind. Make drawings as before. This is a continuation of the state of the growing seeds and the drawings of the seeds in the seed tester. Dig up and make drawings of growing seeds every three days for two weeks. The sand box and seeds should be fixed at the same time, putting



SHOWING PLANT GROWTH FROM DAY TO DAY

And illustrating the kind of drawings that should be made of the growing corn plant.

From "Agriculture for Beginners," kindness Kinn & Co., Publishers.

the seeds in the seed tester so that they will be ready to continue the work without interruption, as this might cause the pupils to lose interest. Arrange the drawings as indicated in the diagram.

Study the beginnings of the corn plant and compare it with other plants for a period of three weeks. Make drawings in each column under the name of the plant and on each line, as indicated by the figure at the left.

Days of Growth	Drawing of Kernel of Corn and Plantlet	Drawings of Bean and Plantelt	Of Squash and Plantlet	Of Peas and Plantlet
Dry seed				
Second day				
Third day				
Fourth day				
Fifth day				
Sixth day				
Seventh day				
Eighth day				
Ninth day				
Tenth day				
Thirteenth day				
Sixteenth day				
Nineteenth day				
Twenty-second day				

SYSTEMATIC, SCIENTIFIC, IMPROVEMENT OF CORN

No work in the study of Agriculture would be complete without giving the young people a glimpse of the marvelous work of Luther Burbank in improving and creating plants useful to mankind. He has done far more for the advancement and happiness of the human family than many soldiers and statesmen whose deeds fill the pages of the world's histories. Every school should have a copy of the book, "New Creations in Plant Life," by W. S. Harwood, published by Macmillan Co., N. Y. There are also many magazine articles.

At the close of a lesson or series of lessons where the pupils have reported some of the many important accomplishments of Mr. Burbank and discussed their importance to society, the teacher should suggest the great field that is open for improvement in the corn plant. It would be well, also, for the

teacher to point out that it is quite possible for some boy in the class to take up this work at once. Let the teacher show that with reasonable long life before him, the boy can accomplish great good for himself and his neighbors, win an enviable reputation, and reap a substantial financial reward. As soon as he has a variety of corn with unusually good qualities his name and fame will spread and his corn will be in demand at very fancy figures. Show the young people that here is something that they can commence at once right at their own door and without waiting to secure capital or a finished education. The work will, in fact, encourage many a boy to get an education who might otherwise have been unable to command the necessary resources. Both the capital and advanced education may be secured as a result of the boy's effort in his chosen field of improved seed corn. Their extra efforts will result in uncommonly large yields and proportionately large profits, even if they sell at the regular market price. There are profits in raising good seed corn and much may be added to this by raising *uncommonly* good seed corn. Be sure to call attention to the fact that the North Carolina State Institutions and the office of Corn Investigations of the United States Department of Agriculture want to help boys become expert corn growers. Here are the world's greatest experts ready to help from the day that the boy begins.

Nearly all the elementary books on Agriculture give suggestions and references about how to proceed in the improvement of plants. Persistently select seed from the type which you wish to secure. In "Agriculture for Beginners," the authors have the following to say about the improvement of corn:

"By judicious and persistent selection, made in the field before the crop is fully matured, corn can be improved to an almost unlimited extent in size and early maturity. Gather only ears from the most productive plants, and save only the largest and most perfect kernels. How many ears of corn do you find on a stalk? One, two, sometimes three or four. You find two ears of corn on a stalk because it is the nature of that particular stalk to produce two ears. In the same way it is the nature of some stalks to produce but one ear, while it is the nature of others to produce three. This resemblance of offspring to parent is known to scientists as heredity. We can take advantage of this law in improving our corn crop. If a stalk can be made to produce two ears of corn just as large as the single ear that most stalks bear, we shall get just twice as much corn from a field in which the two-eared variety is planted.

"This fact ought to be very helpful to us next year when our fathers are planting corn. We should get them to plant seed secured only from stalks that produce the most corn. If we follow this plan year by year, each acre of land will be made to produce more kernels and hence a larger crop of corn, and yet no more work will be required to raise the crop. In addition to enlarging the yield of corn, you can, by proper selection of the best and most productive plants in the field, grow a new variety of seed corn. To do this you need only take the largest and most perfect kernels from stalks bearing two ears; plant these, and at the next harvest again save the best kernels from stalks bearing two or more ears. If you keep up this practice with great care for several years, you will get a vigorous, fruitful variety that will command a high price for seed."

SELECTING SEED FOR A GOOD YIELD

Contributed by C. B. WILLIAMS, Chief of Division of Agronomy for N. C. Experiment Station, A. and M. College, Raleigh.

The London paper *Punch* once printed a picture that shows the value of good parents. A big, strong, well-proportioned ox was proudly looking around. Before the ox stood a small, weazened, stunted, spindle-legged lord.

A NORTH CAROLINA CLUB BOY SELECTING SEED TO SUCCEED.

This lord said to the ox, "What a fine fellow you are!" The ox replied, "Yes, my lord; and if your ancestors had been as carefully selected as mine, you would be a fine fellow too."

Lead your classes to see that just as the ox was fine because its fathers and mothers and grandfathers and grandmothers were fine, so an ear of corn will be fine when its parents were fine. The better ancestry the stalk of corn has the better the stalk is likely to be. Careful selection of seed will also add largely to the yield. Experiments at the North Carolina Experiment Station show that seed selection alone has often resulted in an increase of from ten to fifteen bushels of shelled corn to an acre.

SOME THINGS TO AVOID.

Impress on pupils that when they come to select seed for their fields they

1. Do not select the seed ears in the crib. They can tell little about the corn's parents from seed so chosen.

2. Do not buy seed corn from a distant dealer, no matter how alluringly he advertises, until they have found out from the State Experiment Station

whether the varieties advertised is likely to do well in their section. Good seed for one section is not always good seed for another.

3. Do not buy shelled corn for seed. The parent ear needs to be seen, and better still, the parent stock.

4. Do not buy for seed any variety unless that variety has proved a good yielder in the section in which it is to be planted.

5. Do not buy seed corn merely because it is cheap or because it is high. The price does not affect the yield.

THESE THREE EARS GREW ON THREE DIFFERENT STALKS IN THE SAME HILL.
Differences in the seeds make the differences in the yield.

Courtesy of Professor P. G. Holden. From Kyle & Ellis's "Fundamentals of Farming and Farm Life." Reproduced by special arrangement with Charles Scribner's Sons, Publishers.

6. Do not buy seed merely because the ears are showy. Such seed may not make a similar show in other fields.

7. Do not buy any seed that is soft, light, and chaffy.

8. Do not fail to take the utmost care of seed corn. Keep away weevils, rats, and mice.

SOME THINGS TO DO.

Let the teacher take the class into a corn field in the fall and select seed for the next year's crop. Emphasize these points:

1. That the seed must always be selected in the field where the parent stalks can be seen. Show the pupils the difference between a vigorous, healthy stalk and one that is not so good. Let each pupil take a bag to the field. Whenever an unusually strong stalk with two well developed ears is found, put these ears into the bag. Be sure to take the ears from different parts of the field and do not select from any specially or accidentally formed stalks. If the land on which the corn is to be planted is producing less than twenty-five bushels to the acre, it may be well to select the best ear from stalks yielding only one fine ear. Drill on the thought that seed is needed that will produce the most shelled corn to the stalk.

2. See that ears are selected that are fully matured and thoroughly hardened.

3. Select ears that are borne at a convenient height for gathering. The height of the ear on the stalk should be as nearly uniform as possible.

4. Select many times as many ears as will be needed. During the winter classes can be taught to compare the ears selected and to choose only those that are best.

HOW TO SELECT FROM THESE SEED EARS.

Have the pupils spread their field selected ears on a table. Then call attention to the following characteristics of a good ear.

1. The ear should be well shaped. This means that it should be full and strong in the middle portion. It should not taper much, but should retain its size practically to the tip, so that it will yield a large amount of corn to cob. The kernels should also be uniform in size and depth to near the tip. The rows should be straight and even and close to one another. Do not be unduly attracted by large ears. The cylindrical ear with deep, closely set kernels is usually the highest proportioned yielder of grain to ear.

2. The size of the cob needs attention. A medium-sized cob is best. Too much cob leads to a low relative yield and shows generally a late maturing type. Of course a small cob cannot hold a large amount of grain.

3. Have the pupils carefully measure the length and circumference of the ears. The proportion of length to circumference should be about 4 to 3: for instance an ear 10 inches long should measure about 7½ inches in circumference.

4. It may be easy to show pupils that an ear with well-filled out butts and tips will bear more corn than with poorly filled ones, for all the space on the ear should be used. Insist more on a well-filled butt than a filled out tip, for while the tendency to fill out well at the tip is transmitted, yet season, fertility of the soil and cultivation have much to do with this quality of the ears. Since the fertilization of the ears begins at the butt, weather conditions, a hot, dry wind, a storm, or drouth may injure the vitality of the flowers before the tip of the ear becomes fertilized.

5. Each ear should be examined carefully to see that the number of rows of kernels is large, that the distance between the rows is small. No waste space is wanted on the ear.

KERNEL.

After the entire ear has been studied, center attention on the kernels. Study these with an eye to bringing out these facts:

First. The kernels should be of medium size and should be wedge-shape, not too long and sharp. If the grains taper too sharply they waste space at the cob and do not give room for the germ to grow fully. The kernels should remain deep throughout the whole length of the ear.

Second. The kernels should be uniform in size and shape. Irregular kernels are difficult to regulate in the corn planter.

Third. A good kernel should be full and strong at the tip so as to give room for a large germ. No plant can start properly on its growth unless it has a vigorous germ.

Fourth, the kernels should be sound, thoroughly matured and have a fresh, glossy appearance.

FERTILIZING THE CORN CROP

Contributed by C. B. WILLIAMS, Chief of Division of Agronomy for N. C. Experiment Station, A. and M. College, Raleigh.

(To be studied in connection with the Lessons on Manuring the Soil, in the text-book.)

Bring out the fact that in farming man's part is limited to three things. He can select good seed; he can till well; he can fertilize crops well. Nature must do the rest. How important is it then that man should do his part well.

Remember that the corn plant is a heavy feeder. It must have plenty of food to make a paying yield. In most North Carolina soils nitrogen and phosphoric acid are especially needed. Experiments show that in the mountain section, since most soils in that section are fairly well supplied with

HUMUS HELPS CORN.

(1) Clay subsoil; (2) same, with fertilizer; (3) same, with humus.

From "Agriculture for Beginners," kindness of Ginn & Co., Publishers.

organic matter, phosphoric acid is the chief fertilizer required. In the Piedmont section, both phosphoric acid and nitrogen are required in fairly large quantities. In the coastal plain sections nitrogen and potash are as a rule the fertilizers most needed.

In clay and loamy soils a better crop is grown as a result of applying all the fertilizer in drills just before planting. In open, porous soils subject to much leeching, the best results have been secured from dividing the fertilizer. The first portion should be applied after the plants are up and the remainder applied at or just before the last cultivation.

The corn crop in North Carolina is, when compared with cotton and tobacco, not so remunerative, acre per acre. Hence it must be fertilized wisely or profit will be lost. It needs much nitrogen, but nitrogen is one of the most costly of fertilizing ingredients. Hence the importance of securing the nitrogen for the corn crop by means of leguminous crops. These crops should be grown in such rotation as to have the corn to follow directly after a leguminous crop. As stable manures are rich in nitrogen they are most valuable in growing a large corn crop.

HOW TO CULTIVATE THE CORN CROP

Contributed by C. B. Williams, Chief of Division of Agronomy, N. C. Experiment Station, A. and M. College, Raleigh.

In approaching the cultivation of a crop it is well to let pupils see what is to be obtained by proper tillage. These are the chief advantages:

First. To stir and loosen the soil so that the plant roots may successfully extend into the soil.

Second. To so pulverize the soil that all its parts may be mixed and plant food evenly distributed.

Third. To loosen the soil so that a warm and comfortable bed may be ready for the young plant.

Fourth. To cover manure, stubble, stalks, and other manurial material, so that it may be more easily and quickly changed into humus.

Fifth. To destroy weeds that use up plant food and moisture.

Sixth. To save all the moisture possible by keeping a mulch on top of the soil.

Seventh. To air the soil and help control the temperature.

SOME POINTS TO DISCUSS.

1. Impress the need of vigorous growth and show how good tillage promotes such growth.

2. Point out how a crusted surface hinders growth and how to prevent the crust.

3. Lead pupils to see how land filled with humus allows water to penetrate and hence heavy rains do not pack and crust the soil.

4. Examine a field of corn that has just been "barred off," and show how a shallow cultivation with a harrow and weeder would have saved the mangling and exposure of the roots.

5. After studying this field, induce the pupils to get acquainted with the root systems of different farm crops, so that they may know how to cultivate them.

6. Get pupils to see that a corn crop will suffer if cultivation stops too soon, for if it does weeds and grass steal its plant food and its moisture.

THE SEED BED.

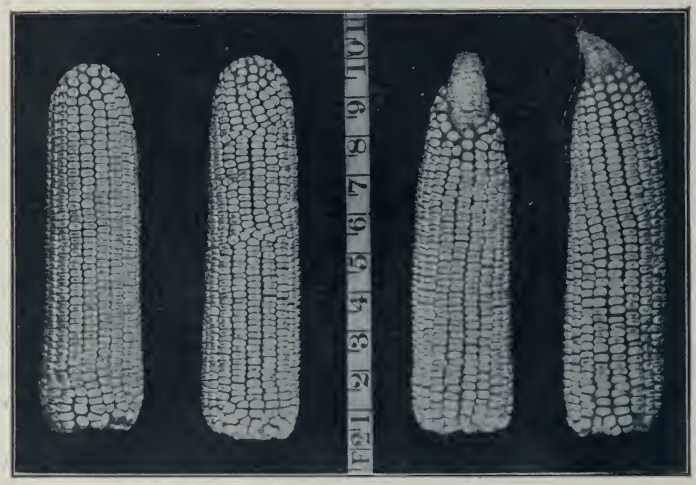
1. To show the necessity of a good seed bed, select a near-by field. Prepare a few adjacent rows as directed in the section on soil in "Agriculture for Beginners." Plant other adjacent rows after shallow plowing and careless preparation. Have the pupils compare the results when both rows are cultivated in the same way.

SEEDING.

Plant the corn as soon as the land is warm enough to sprout the seed. Always use a corn planter so that a more even stand may be secured. If the land has not recently been plowed, run a harrow or weeder over the soil so as to kill all weeds and grasses. The distance of the rows and the distance of the stalks in the rows must be governed by the purpose for which the corn is to be used and by the fertility. The richer the ground the closer

the stalks can stand in the row. As a general rule corn does best in rows about four feet apart and with the stalks from 18 to 30 inches in the rows. The depth at which the seed is to be planted will vary with the season and with the character of the soil and the date of planting. The drier the season, the more open the soil, and the later the planting the deeper the seed should go in the ground. On sandy soil the seeds should be planted deeper than in clay or loam soils. In all planting the seeds must be placed deep enough to reach moist earth. On the average soil and under average conditions a depth of one inch usually gives the best stand.

Cultivation should begin before the corn comes up. You do not want to allow weeds to grow nor a crust to form. The early cultivations should on sandy or sandy loam soils be with seeders or with slanting spiked tooth harrows on more compact soils. If weeds and grass are growing too rapidly for the weeder use the harrow on any soil. The growing crop should be run over with harrows or cultivators every ten days or two weeks, and immediately after rains. Cultivation ought not to stop until the corn is tasseling. Even later cultivations may be profitable.



IMPROVEMENT OF CORN BY SELECTION.
Original ears on right.

From "Agriculture for Beginners," kindness Ginn & Co., Publishers.

ROTATIONS FOR THE CORN CROP

Contributed by C. B. WILLIAMS, Chief of Division of Agronomy, N. C. Experiment Station, A. and M. College, Raleigh.

Let the teacher fit this lesson in with the section on "Crop Rotation" in "Agriculture for Beginners."

Every child should understand exactly what is meant by crop rotation. Explain that it is growing crops in a certain field in regular turn, year by year. There are a great many different kinds of rotation, but each farmer ought to have one that suits his needs and his markets.

Bring out by questions why it would be bad farming to grow the same crop on the same land each year. By having a few roots of different plants on the desk show pupils that plants have different ways of growing—some go deep into the soil while others feed only near the surface. Would it not be well to vary the different plants in a field so that one plant with its deep roots can get food that another could not reach? Point out that some plants grow only in summer and some only in winter, and hence how a rotation ought to be chosen that will always keep some crop on the land. Present the fact that some crops add nitrogen, a costly fertilizer, to the soil, while others when removed take much nitrogen out of the land, and drill on the fact that these nitrogen-gathering crops ought always to have a place in a rotation. By quoting prices illustrate the fact that some crops are especially planted as money crops and that to give these a chance to pay well the ground ought to be enriched for them by the crops going ahead of them. Direct attention to the scarcity of labor and let them see how much easier it is for a farmer to cultivate his land if he plants crops that grow at different seasons and are harvested at different times. Let the class estimate how much can be saved in a fertilizer bill by such a rotation for corn that no nitrogen need be bought. Especially make clear that different plants use plant food in different proportions. Hence by varying the crops the growing plants can use better the plant food stored in the soil. Explain how necessary humus is to the soil and lead them to see that a proper rotation will keep up the supply of humus. By means of the cotton-boll weevil and other insects illustrate how serious insect pests thrive only on certain crops, and hence how these pests may be controlled by depriving them of food when crops are changed, and follow this teaching by showing that plant disease can be controlled in the same way.

It may help to have pupils put on the board a summary like this:

1. The soil is kept in better condition by proper rotation.
2. A proper crop rotation aids in keeping the land rich.
3. A proper rotation enables the farmer to plan his work to better advantage and to save hiring extra hands on busy seasons and keeps his teams from being idle.
4. A proper rotation lessens the fertilizer bill.
5. A proper rotation reduces the danger from insects and diseases.
6. A proper rotation makes it easier to keep a supply of humus in the soil.
7. A proper rotation increases the average yield and profits.
8. A proper rotation means that the landowner will have something to sell at many seasons instead of only one.

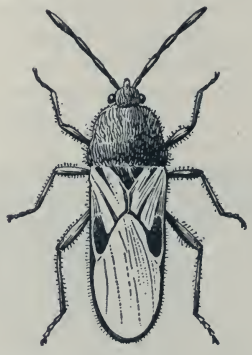
A proper rotation by keeping crops on the soil lessens the washing away of soil and soil fertility.

As pointed out in an Extension Bulletin from the Iowa Agricultural College a good rotation of crops includes:

1. One or more cultivated crops as corn, potatoes, or root crops.
2. One legume, as clover, alfalfa, vetch, or peas.
3. One leguminous "catch crop," as cowpeas, field peas, or soy beans.
4. One small grain, as wheat, oats, rye.
5. It may contain pasture grasses. The grasses may be mixed in such a way as to afford hay one year and pasture the next.

CORN PESTS AND DISEASES

So far as the writer has been able to find out, by careful examination of records and observation, two hundred and nineteen species of insects have been recognized and recorded as in some way being injurious to some part of the corn plant. For the sake of convenience these have been arranged according to their attacks upon the various parts of the plant. For instance, eighteen are known to infest the seed; twenty-eight have been discovered upon the root and underground parts of the stalk; seventy-seven have been recorded as injuring the stalk above the ground; one hundred and nineteen



THE DREADED CHINCH BUG.
A Little but Mighty Enemy of the Farmer.
Courtesy Ginn & Co.

(For a complete series of pictures, in natural colors, showing all the stages in the life history of the chinch bug from the egg to the adult, see the State-adopted text-book, "Agriculture for Beginners," page 140 old, or 164 new edition.)

attack the leaf; nineteen are known to injure in some way the tassel and silk; forty-three work upon the ear in the field; two have been found upon stacked fodder; and twenty-five others in corn in store or in manufactured products. Many of the species recorded in this list are of minor importance, and only the primary ones, found more or less injurious to the corn plant every year are here considered.

Perhaps the most serious injury to corn occurs when insects attack the seed and root. This usually happens early in the season, but fortunately for farmers much of this damage can be prevented by precautionary and preventive measures at the proper time. The following practical hints, as a brief introduction to this chapter, will assist the average person in recognizing the insects responsible for injury to corn either in the field, in store, or in manufactured products.

1. Many farmers attribute the failure of corn to come up promptly to poor seed, if it does not appear in due time under favorable conditions. A careful examination of the seed itself should be made for evidences of injury by wireworms, seed corn maggots, etc., all of which do much damage frequently to seed after it is planted.

2. At times young plants make a very unequal start. Some hills will appear early and grow rapidly, while others are dwarfed and make no perceptible growth. In such cases the roots should be searched for the presence of the corn root louse. Very often the insect attacks the sprouting plant before the leaf shows above the ground. The presence of numerous large brown ants in the corn land, often burrowing in the hills, is also evidence that plant lice are at work at the roots. At other times the corn may be retarded in large patches, the leaves turning yellow at first, and a little later taking on a reddish tinge. In such cases a careful digging up of the hill will probably reveal the presence of root lice. If none are found the difficulty may be attributed to a fungous disease known as the root blight of corn which has no connection with insect injury.

3. Sometimes all the stalks in the hill are colored and wither when a foot or less in height. This condition usually follows injury by wireworms and white grubs.

4. When the corn falls over easily with a slight wind storm and does not rise up again in due season, one should be suspicious of the presence of the corn root worm, as well as injury by white grubs.

5. Where the corn remains green too long, matures slowly, with many sterile stalks, and contains imperfect nubbins and ears, in all probability the common corn root worm will be found in abundance among the roots, if careful examination is made late in August or early in September. In such cases large numbers of green beetles about the size of the common ladybug may be seen at work upon the silks and tassels, and even upon the pollen collected at the base of the leaves. They are also found upon the blossoms of rag weeds and other flowering plants in the field. These are the adults of the corn root worm, and such fields should not be replanted to corn the following year.

6. Frequently young plants will have the terminal leaves dwarfed and curled so that the growing tips are shriveled. Occasionally the foliage is deformed and of unequal growth, especially the unfolding of the leaves from the roll at the terminal. These are more or less injured, giving the ragged appearance. Damage of this kind usually occurs when the corn is about two feet high and is the work of the first generation of the corn worm, while later the second generation is found in the ends of the ears doing serious harm later in the summer and early fall.

7. Some times a series of shot holes are found extending across a well-developed leaf. The holes are usually elongated and arranged side by side quite regularly, and are usually the work of one of the corn bill-bugs.

8. Sometimes the leaves of young corn are irregularly eaten away, many of them having a gnawed appearance at a time when the stalk is less than a foot high. In such instances fine particles and small lumps of earth at the base of the plant will be found closely webbed together in a mass usually about the size of an ordinary walnut. Such condition is the result of the work of the root web worm.

9. The work of the ordinary cutworm is well known to most farmers. The young corn is usually cut above and below the surface of the ground, and examination usually reveals the culprit hidden in the ground not far away.

10. If the stalk has a small hole with brown, moist powder exuding from it, it is sufficient evidence that the cornstalk borer is within. These creatures do great damage to young corn in the spring, especially in low ground.

11. When the ear is found with the end eaten and burrows leading into it from the top toward the base, the destructive corn worm can usually be found. Its burrows are usually filled with excrement, discoloring and injuring the ears to a considerable extent while they are in the soft stage.

12. Injury by grasshoppers is not uncommon, and often the entire leaf is eaten, leaving only the midrib, while others are gnawed and filled with irregular holes, giving them a very ragged appearance.

13. If the corn in the granary loses materially in weight and is filled with small holes, the indications are that it has been injured by the grain moth, or weevil. Very often the presence of these pests can be ascertained by the sawdust-like siftings which accumulate in the lower part of the bin or crib where they are abundant.

14. In corn meal and other manufactured products the Indian meal moth can be ascertained by the presence of the young worms and the matting together with the meal with small particles of silk spun by the larvæ of the worms. A large number of moths flying about the pantry, mill, granary, or other places where corn products are stored, is usually sufficient evidence that the products are infested and should be looked after without further delay.

The above is from the "Book of Corn," page 245, published by the Orange Judd Publishing Co., New York. An exceedingly valuable bulletin published by the North Carolina Department of Agriculture is "Insect Enemies of Corn." It is free for the asking. Send for it.

REFERENCES ON INSECTS THAT INJURE THE CORN.

In this brief bulletin no attempt will be made to describe the various insects that injure corn and no detailed directions for fighting them. The following references give extended, profitable and interesting information on this subjects:

"Insect Enemies of Corn," North Carolina Department of Agriculture.

United States Farmers' Bulletins on Corn (see general references).

"Farm Friends and Farm Foes," by Clarence Weed, published by D. C. Heath & Co:

Corn root aphis, page 92.
Corn rust, page 238.
Corn smut, page 228.
Corn stalk borer, page 112.
Corn worm, page 111.

From the bulletin of the North Carolina Department of Agriculture on "Insect Enemies of Corn" we gather these significant statements: "Nearly one-half of all the land planted in crops in North Carolina each year is devoted to corn. The yearly money value is estimated at $70,000,000. The corn crop in North Carolina suffers an average loss of $7,000,000 per year from insect pests. What with the wire-worms, cut-worms, bud-worms, weevils, and others, the corn plant certainly seems to suffer its full one-tenth loss. In combating many of the insect pests of corn we must rely on such methods of culture and handling of the crop as shall render it least liable to injury; in other words, the treatment must be *preventive* rather than *curative*."

But why quote? Every school should have the bulletin. It is most valuable.

CORN SMUT.

This fungus is common throughout the United States. It lives by absorbing the sap which the growing corn has prepared for its own use. It usually causes a loss of from 1 to 2 per cent, but in occasional cases may destroy half the crop. The smut of wheat and oats and the scab on potatoes may be controlled by dipping the seed in a solution of formalin, but corn smut cannot be destroyed in that way. In the former case the spores are on the seed, while in the case of corn the spores live in the ground and are blown about the field while the corn is young. When the corn is abou two feet high small grayish white patches may be seen growing on the leaves. This is growing smut. The patches soon turn dark, however, and belore long nearly black. The patches soon burst and the black spores are carried to other stalks by the wind. If they lodge on some tender growing part of the stalk, such as the node, the tassel, or the silk at certain times, they enter the substance of the corn plant and live on the juices intended for the growth of the plant. There seems to be no particular way of controlling this parasite. On the small patch grown by the student it may be possible to take off the gray patches as they appear on the very young corn. The richer the soil the better the smut spores live and grow in it.

It is a relief to know that the smut is not injurious when eaten by men or animals. "The Book of Corn" has this to say: "In 1784 the distinguished French investigator, Imhof, experimented upon himself by taking a considerable quantity of the spores before breakfast every morning for a fortnight, also applying the spores to a wound on his hand, and employing them as snuff, without experiencing the slightest harm or ill effects." The same book sums up our knowledge of this matter in the following words: "A concise statement regarding present knowledge of the action of corn smut upon animals would be that it is a highly nutritive food, quite harmless, except when eaten in excessive amounts, and then only rarely. The small amount of narcotic-like substance which it contains may under all ordinary circumstances be ignored."

LESSON ON WEEDS.

One of the first and most important things to do if you wish to defeat an enemy is to learn all you can about him, so if we wish to destroy weeds we study them and their habits. We will discover that many weeds die each year. These are called annuals, such as pig weed, crab grass, jimson weed, chess, dodder, and mustard. If these can be prevented from maturing there will be no weeds of this kind for a few years.

Those plants that grow for one season and store food in the root and then this root grows next year and produces seed are called biennials, wild carrot, wild parsnip, burdock, some kinds of thistles, etc. To kill these it is necessary to cut off the root below where the leaves start, that is, below the crown of the root.

Of all weeds the worst are those that live for more than two years. Botanists call them *perennials*. The root must be killed or they go on producing more plants from the root. Some of them have a part that grows under the ground called the root-stalk. As this grows along under the ground it sends up shoots at short intervals to form new plants. These plants frequently produce seeds also. There are many kinds of grass: Canada thistle,

poison ivy, dock, and many others that might be given as examples of perennials. Sometimes where there are only a few of these weeds they may be smothered with a deep layer of straw, by laying boards on them, or they may be dug out entirely. They may sometimes be destroyed by frequent shallow plowing, especially in late autumn and winter. Some of them may be smothered by a rank growth or cow peas or other rapid growing crops.

HARVESTING THE CORN

Come, let us pluck the corn,
The bounteous, golden corn!
Mark well the plants; observe the yield;
And wait the autumn morn
When Nature says, "The work's complete!"
Then garner in the corn!

The most important operation for the corn farmer, whether old or young, large or small, after he has raised his crop is to harvest it. This should be done economically and at the right time of the year. In some of the northern parts of the Middle West they harvest their corn with a regular self-binding harvester, the same kind that we use for cutting wheat. The only reason that they can use this machine for cutting corn is that the corn is so small. Their season is too short to raise the large kind of corn. In the great corn belt they do have corn binders that are so successful that these are coming into general use. Some of the largest corn farmers use as many as ten at a time. They operate best in corn of medium size, but it is possible to handle corn sixteen feet high with good results. The machines are so constructed that they will save corn that is badly blown down, provided the stalks do not lean in the direction the machine is being driven.

Where it is not practical to have a corn binder a drag cutter in the form of a sled will save much of the drudgery of corn cutting. These sled cutters are easily made at home. A horse draws the sled between two rows of corn and the knives, placed obliquely at the sides in front, cut the stalks of corn. The stalks are caught by men on the sled. When the men get their arms full the sled is stopped and the corn placed in the shocks. If low wheels are placed under the sled it will be drawn much more easily.

The great bulk of the corn of the Middle West is husked from the standing stalks in the field and thrown into a wagon which keeps right alongside of the huskers. One side of the wagon-bed has an extra wide board to keep the ears from being thrown over the wagon. By this method the corn was generally sold and the stalks pastured in the field. Most of the fodder was wasted and what was left until spring was burned. In this way practically nothing was returned to the soil. The soil lost its productive capacity until today the most serious problem confronting the farmer in the corn-belt is how to harvest and dispose of his corn crop and at the same time retain the greatest amount of fertilizing elements. The best farmers are solving the problem by feeding corn stover to stock on the farm and returning the manure to the soil. Cattle and hogs are bringing such good prices now that there is great profit in this method of farming. This is especially true of dairy farming.

The great bulk of fodder is cut by hand and allowed to dry in shocks. These shocks should be as large as will dry out well. In moist regions care

should be taken in putting up large shocks so that they will not twist and fall down. Set the first armfulls down firmly and squarely against each other with the butts well out from the base. When the shock is completed, tie firmly.

In some places in the south we have a practice which is very wasteful. In his book, "Agriculture for Southern States," Professor Dugger gives some good advice: "Many farmers in the Southern States strip off the corn leaves to obtain 'fodder' with which to feed their teams. When the farmer strips the green leaves from the corn plant he stops the accumulation of carbon, the material of which the corn grain chiefly consists; thus he reduces the yield of corn grown several bushels to the acre. The same amount of labor employed in making hay as in 'pulling fodder' would produce much more feed for stock."

Another unprofitable method is to cut the tops just above the ears at the time when the outer shucks have turned brown. If this is done when the ears are fairly mature it does not materially reduce the yield of grain, but it is a very expensive way to get feed. The most profitable way to harvest the corn crop is to cut and shock the whole plant.

THE CANNERY FOR GREEN FEED

SILO—ENSILAGE.

A silo is an air-tight structure for the preserving of green forage crops, such as corn, sorghum, milo-maize, cow-peas, and kaffir corn in their original green state. Any of this material preserved in a silo is called *silage*, or *ensilage*.

The silo is important because it furnishes the best means of providing green feed for stock in winter. It is essential that live stock should have green feed, just as it is necessary that we should have fruits and vegetables for our own diet if we would keep our bodies healthy. Since we cannot always have these fruits and vegetables fresh we can and preserve them for our use. The silo is the cannery for the green feed for stock. Another advantage of putting the corn plant into the silo is that live stock will be able to eat the whole stalk, while if the stalks are cut and dried a large part of the stock is so hard and unpalatable that it is not eaten. The silo enables the farmer to use more feed and have better feed from the crop he grows. It is important that all live stock should have green feed, but it is especially true that the dairy cow should have succulent food if she is to give large amounts of milk.

The most profitable corn silage is that which is cut at the time the kernels on the ears are glazed and the lower leaves begin to turn brown.

The plants are cut into short pieces by machinery and then blown or carried to the top of the silo. The silage is then packed as tight as possible. Here it ferments, becomes very hot, and causes the formation of carbon dioxide in the silage, which forces out all the air. This kills the bacteria and keeps the silage in a sweet condition.

At first the silo was made by digging a square hole in the ground. The farmer filled this with green fodder and covered it with soil. The inconve-

nience in removing the ensilage soon led to building the silos above the ground. The first silos built above ground were made square, but the difficulty experienced in filling in the corners so as to exclude the air caused the square type to be abandoned for the round type. The air being left in the corners was very serious, because wherever air enters the silage molds and spoils. The height of the silo must be sufficient for the weight of the ensilage to be great enough to force out most of the air by packing. The silo should not be too large in proportion to the number of stock to be fed, because the feeding is commenced at the top and should proceed fast enough so that the top layer will not be exposed to the air long enough to spoil.

If possible the teacher should take the class to see a silo as it is being filled. This subject is of such importance that some time should be spent in the study of the advantages of handling corn in this way.

Write to the North Carolina A. and M. College, and the State Department of Agriculture for information. Send for U. S. Farmers' Bulletins, No. 32, "Silos and Silage"; No. 292, "Cost of Filling Silos." Other information may be obtained by referring to the "Encyclopedia of American Agriculture," Vol. II, page 566; "Elements of Agriculture," page 171, or the "Book of Corn," page 128.

EXERCISE FOR A CLASS IN A FIELD OF CORN

The summer grains were harvested; the stubble fields lay dry,
Where June winds rolled, in light and shade, the pale green waves of rye;
But still, on gentle hill-slopes, in valleys fringed with wood,
Ungathered, bleaching in the sun, the heavy corn crop stood.

Bent low, by autumn's wind and rain, through husks that, dry and sere,
Unfolded from their ripened charge, shone out the yellow ear;
Beneath, the turnip lay concealed, in many a verdant fold,
And glistened in the slanting light the pumpkin's sphere of gold.—*Whittier.*

The teacher should secure permission to take the whole class to a near-by cornfield for the purpose of making observations necessary for estimating the yield of the field, and to secure information and material for other lessons on corn.

Be certain that each pupil has a clear understanding of all the different things that are to be done on the trip and the form in which the information is to be recorded. The work should be accurate and interesting. There should be a spirit of comradeship joined with snap and vivacity; yet no real foolishness tolerated, or any killing of time permitted. If there are any pupils who cannot be made to see this work in the right light they should be required to study some other lesson during the time the other pupils are taking these trips.

Under the imaginary condition that the field of corn is to be sold to the highest bidder have each pupil make a written bid of all he thinks the field is

worth. The teacher will keep these bids to compare with the results obtained by the class after making the careful calculations.

Divide the class into sections of two or three each.

Let them have plenty of paper ruled both ways. (Perhaps the best scale will be ¼″ to 1′.) In each square may be marked the number of stalks growing in that particular hill. Let dots represent stalks and figures represent the number of ears (which may be more or less than the number of stalks) in the space representing each hill. *S* will indicate *smut.* See diagram below for practical illustration:

• • • 3	• • • ·3	• • • 4	• • • ·4S	• • SS						

In the above diagram the hill in the upper left-hand corner of the plot has three stalks, represented by three dots, and three ears of corn, represented by the figure 3. The second hill has four stalks and three ears, indicating that one stalk has no ear. The third hill has three stalks and four ears. The fourth hill has four stalks and four ears, one stalk has smut on it. The fifth hill has two stalks, no ears; but two bunches of smut.

Each hill should be marked while in the field and any peculiarities written out in the form of notes on the back of the diagram. Urge the pupils to make notes and marks very clear while in the field, as it may be impossible to go back to verify them.

The pupils should have the following information: Total number of stalks, number of stalks without ears, total number of ears, number of stalks with two or more ears, number of stalks of corn with smut. They should also make note of the number of corn suckers, and carefully investigate to see whether or not these suckers have independent root systems or whether they draw their nourishment from the main stalk.

The pupils may not be able to secure all of this information at one lesson; if not let them have as much time as they really need. Be sure to demand real results.

Upon arriving at the field let each division measure off one-tenth of an acre. This one-tenth of an acre may be of various shapes, but must contain 4,356 sq. ft. This is 43,560 sq. ft. (the contents of an acre) divided by 10. It may be square, 66 ft. by 66 ft. On the diagram, drawn to the scale of one-fourth inch to the foot, this would take the space of 16½ inches by 16½ inches. The one-tenth acre may be 80 ft. by 54.45 ft.; on the diagram, 20 inches by 13.5 inches. It may be 40 ft. by 108.9 ft.; on the diagram 10 inches by 27 inches (approx.).

Measure this one-tenth of an acre in as many different places in the field as you have divisions of pupils. Try to place these plots so that about one-fourth of the plots will be in the part of the field which you consider the poorest; one-fourth in the part of the field which you think is best; the remaining two-fourths in the part of the field which you consider a fair

average of the whole field. Consult the class freely. It is more important for you to have the coöperation of the class than to have the exact portions of the field which you may think are the best. Have each division do its work carefully.

WORK IN THE SCHOOL ROOM.

The pupils will report the number of ears found on each tenth of an acre plot. The average number of ears on one-tenth of an acre may be secured by adding all these together and dividing by the number of plots. This multiplied by ten will give the number of ears to the acre.

COMPARATIVE YIELD OF FIVE HIGHEST AND FIVE LOWEST YIELDING EARS.

One 80, the other 40 bushels per acre. How much is North Carolina losing each year by planting inferior seed corn?

Courtesy of Professor P. G. Holden. From Kyle & Ellis's "Fundamentals of Farming and Farm Life." Reproduced by special arrangement with Charles Scribner's Sons, Publishers.

Weigh several representative ears and estimate the number required for a bushel of corn. Fifty-six pounds make a bushel of shelled corn; 70 pounds are usually taken for a bushel of corn on the cob. (Ohio and Indiana only require 68 pounds, while Mississippi requires 72.)

By dividing the number of ears per acre by the number of ears required for one bushel the number of bushels per acre may be obtained. To ascertain the number of bushels of corn in the field, multiply the number of bushels per acre by the number of acres in the field. Multiply this by the local price of corn to secure the gross amount the field will bring.

After this is made clear estimate the expense for gathering the corn and getting it to the local market. This must be subtracted from the gross amount to get what the pupil could offer to pay for the field of corn. No account is taken here of the fodder. This may be figured later.

Do not complicate the work, especially at first. Let one point be allowed to stand out clear and distinct.

There will be great interest in comparing the actual value of the field of corn as carefully estimated, with the amount offered as a guess by the various members of the class.

SYSTEMATIC PRESERVATION OF INFORMATION

The habit of systematically collecting and recording information gained is so valuable and so fascinating that I strongly urge every teacher to have her pupils make pamphlets in which to summarize their work with corn. These booklets on agriculture would make an excellent contribution to the practical exhibit which Supervisor Brogden has planned for the State Teacher's Assembly. To exhibit them would be an incentive to pupils to do good work, and would offer helpful suggestions to teachers. These suggestions, written by Prof. E. C. Bishop for the boys and girls of Iowa will be just as helpful for the school children of North Carolina as for pupils of the prairie. Teachers do not, of course, have time to carry out all of the work outlined, but every teacher will surely find many suggestive things that she can use.

AGRICULTURAL BOOKLETS.

What Are They?

After the class has completed the study of a topic some interesting way of crystallizing the pupil's knowledge is needed. There is no better way of having a pupil get together what he knows about the subject than to give him something to do that is worth doing—something in which he can exercise originality, and by which he can work what he knows into some permanent attractive form. When pupils understand what is wanted they always take hold and do the work well.

The essays or compositions on the various phases of the general topic are to be practical write-ups of whatever may be learned by the pupil, either in or out of the school room. In fact a great deal of the language work of the school, as well as much of the other work, can best be handled by working up the materials from field trips, and from the experiences and knowledge of the pupils. These may be illustrated with original drawings, copy drawings, or pictures cut from papers, circulars and bulletins in such a way as to develop other desirable educational values. All such work can be embodied in the booklet. The desire to have a creditable booklet provides a vitalizing influence which leads to the pupil's best work in English, in writing, and to general accuracy and systematic work.

SOME GOOD REASONS FOR MAKING BOOKLETS.

1. Pupils like to do the work.
2. The making of the booklet helps to crystallize the pupil's knowledge.
3. Each pupil works for himself and on a subject in which he is interested.
4. Booklets help to teach the pupil to systematize knowledge and to organize materials.
5. Booklets are really permanent notebooks and records which provide a means of original definite work by pupils.
6. Every child likes to make collections and investigations, even with the least of direction.
7. The search for suitable material, both for information and illustration purposes, is interesting and profitable work.
8. The home folks like to see the systematized and clearly and definitely expressed knowledge of the child in attractive permanent form.

OUTLINE FOR A CORN BOOKLET.

The subtopics below outlined for the corn booklet are given in order of the seasonal study of the topic "Corn." As the work is taken up in class each heading may be used as the subject of a composition. The teacher should modify the outline to fit the work done by the pupils.

After a study has been made of the subtopic, the write-up should follow. Pupils should illustrate with drawings and with pictures and introduce any suitable illustrative material they wish to use in the way of specimens which may be attached. These compositions are to be graded by the teacher and proper credit given the pupil for work in whatever subject may be under study and in which he receives educational training of value. Then, after the pupil has seen the graded and marked manuscript, the teacher will file all the papers for later use in making the booklet. This is just the thing to encourage.

At the completion of study of the topic, time enough should be taken to allow each pupil to make up and to bind his compositions into a booklet. After discussion in class as to the best method, the order of arrangement can be left entirely to the pupil, or the teacher may indicate an order in which the essays might appear to advantage. The teacher should bear in mind the following:

SUGGESTIONS ON MAKING BOOKLETS.

1. A booklet is not an encyclopædia of information. It has in it only the things the child knows and it should reflect the personality of the child. The language should, therefore, be original.

2. Only matter digested and understood by the child should be used. Never permit the copying of printed material for booklet use, as it will likely not be well understood by the child. It will not represent his acquired knowledge until he can write it in his own words.

3. If printed material is to be used in its original form a clipping may be made and pasted on the page. Short quotations, properly credited, may occasionally be used.

4. Bookish booklets should be avoided—that is, have pupils use only the things they actually know or need for illustration.

5. Do not allow any matter to go into the booklet that is beyond the comprehension of the pupil making the booklet.

6. Make use of any good information that a child has or will work up for himself, either alone or under proper direction.

7. Encourage the use of materials gathered from the pupil's experience.

8. At the completion of the study of a subtopic or division have the pupil to write it up as a class exercise. It should then be graded and if necessary be copied and put into final shape for binding in the booklet.

9. Do not have the pupil complete the booklet until he has completed the study of the topic.

10. Present the various subtopics in a definite way and require each pupil to prepare and follow an original outline in compiling his booklet.

11. The main divisions should be worked up as chapters.

12. Aim to have one or two good illustrations on each page. They need not be large, but should relate to the subject matter.

13. The illustrations should be the pupil's own drawings when at all possible.

14. When pupils cannot illustrate with original or copy drawings, pictures neatly cut from papers, magazines and catalogues may be used.

15. The illustrations should be applicable to the particular part of the topic discussed.

16. Large flashy pictures are to be avoided.

17. Over-illustration is not in good taste.

18. The pupil in preparing a page should lay the picture on the page, indicate outline, write the page and then paste the picture if copy is as nearly perfect as he can make it.

19. The writing and illustration should be so arranged as to give the page a tasty appearance.

20. The booklet should be written in ink of the same color throughout. Clean paper—no blots, pages not crowded.

21. A uniform paper of good quality, in size about 8 x 10, 8½ x 11, or 9 x 12 inches is desirable.

22. The pupil should apply all the common rules of composition, be absolutely correct in spelling and put forth his best efforts in penmanship.

23. When complete have pupil make cover of gray or brown or other neutral colored art paper, bind the tops of the pages and tie neatly and securely with a small cord or ribbon.

24. The cover decoration may be a small picture or drawing, and it is best to avoid gaudy colors. A neat border design, or large drawn lettered title is very attractive. The cover design should illustrate so far as possible the subject matter of the booklet work.

25. Grade the completed booklet as a whole and file where it may be examined and consulted by other pupils and visitors.

26. Pupils should be encouraged to take booklets home for examination by parents and exhibit them on proper occasions.

27. Booklets intended for exhibition purposes should be kept clean and in good condition.

28. On the front cover of the booklet should appear the following:

1. The title or subject.
2. The name of pupil, his age and grade in which classified.
3. The name of the teacher.
4. The name and number of the school district.
5. The name of county, township and state.
6. The date when completed.
7. An appropriate illustration.

SOURCES OF MATERIALS FOR BOOKLET.

Field observations; experiences of pupil; conversations with parents or friends; things learned in class; things learned from books, bulletins, farm papers, etc. Have pupils send for government and state bulletins, seed and flower catalogues. Write advertisers for information.

Illustrations may be secured by cutting pictures from farm papers, bulletins, catalogues, etc.

SUGGESTIVE OUTLINE FOR A CORN BOOKLET.

Selecting Seed Corn:
- Good seed—how it is judged.
- Time to select seed corn.
- How to select and gather.
- Storing seed—How, when, where, why?

Determining a Stand of Corn:
- How thick to plant corn, and reasons.
- Advantage of planting in hills or in drills.

Harvesting the Crop:
- When to harvest.
- Ways of harvesting.
- Machinery used.
- Storing corn: Things to consider.

Corn Silage:
- The silo: How to make and fill; cost.
- Value compared to fodder, hay, etc.

Corn Yields:
- Yields in school district, county, state, United States, and other countries.
- State or district corn map showing yields by counties or farms.

Value of Corn Crop to Farmers:
- Selling corn compared to feeding it to stock.
- Relation to fertility of land.

Marketing:
- When, where, how much?
- Losses in handling, storing, etc.

Origin and history of the corn plant.

Corn Types:
- Description.
- Varieties of types.

Corn Kernel:
- Parts, composition, location of color.
- Drawing showing section of the kernel and location of parts.

Corn Products and Their Uses:
- From kernel.
- From cob.
- From stalks and leaves.
- From husks.

Corn Judging:
- Purpose of.
- Method of improvement.

Score Card:
- Why used.
- Explanation of score card for corn.

Seed Corn Testing:
- Reasons for testing.
- How to test.

Grading Seed Corn.

Planting Corn:

- Season.
- Preparation of seed bed.
- Use of planter.

Cultivation of Corn.

The Corn Plant:

- Description.
- Enemies.
- Relation of corn growing industry to other community, state and national interests.

THREE STALKS SHOWING DIFFERENCE IN SEED, ALL FROM SAME HILL.

Courtesy of Professor P. G. Holden. From Kyle & Ellis's "Fundamentals of Farming and Farm Life." Reproduced by special arrangement with Charles Scribner's Sons, Publishers.

SOME MATERIAL TO HELP IN THE STUDY OF CORN

Before giving a list of the bulletins, books and pamphlets useful for this work with corn I want to call special attention to the use of agricultural papers in this work. I would mention especially our most excellent paper, the *Progressive Farmer*. A copy should be taken by every school. If the school cannot be persuaded to subscribe for it, some of the children will gladly bring a copy from home every week. Almost every issue has some excellent articles about corn and every issue is alive with information that is so vital that every agricultural class should not only read, but discuss these topics fully in class. The issue of August 29, 1914, has some good pictures and especially appropriate advice relative to selecting seed corn.

The *Progressive Farmer* will doubtless be glad to publish any particularly good reports that any of the pupils may write. It will also be glad to furnish information and advice. A report from the school showing progress in work in practical agriculture should be sent to him. It will do your pupils good to have this recognition and will be an incentive to other teachers to undertake such work.

NORTH CAROLINA BULLETINS.

The most important bulletins to secure, because they are written particularly for North Carolina, are those published by the North Carolina Agricultural College and Experiment Station at West Raleigh, and by the North Carolina Department of Agriculture at Raleigh. These departments will be glad to put your school on the mailing list for all of their publications if you will write to them.

There are a number of important ones on "Corn." Among them are "Corn Weevils and Other Grain Insects"; "Silo Facts"; Bulletin 204, "Some Factors Involved in Successful Corn Growing";—these by the North Carolina Agricultural Experiment Station, West Raleigh. The following are Bulletins of the North Carolina Department of Agriculture at Raleigh: "Insect Enemies of Corn"; "Corn Culture in North Carolina"; "Hints on the Selection of Corn for Seed and Exhibition"; "Winter and Spring Work in Selecting Seed Corn"; "July and August Work in Selecting Seed Corn"; "Annual Report of Farmers' Institutes, 1907"; "Variety Tests of Corn."

Communicate with Professor T. E. Browne, in charge of the Boys' Corn Clubs, Raleigh, N. C., for information and advice.

For farmers' bulletins and all publications of the United States Department of Agriculturae, application should be made to your Congressman, or to the Division of Publications, U. S. Department of Agriculture, Washington, D. C. Ask to have the farmers' bulletins and the monthly list of publications of the Department of Agriculture sent regularly to the school.

The following books should be in the library: "Agriculture for Beginners," by Burkett, Stevens and Hill (the State adopted text-book and a most excellent little manual); "The Book of Corn," by Myrick; "Corn," by Bowman and Crosley; "Study of Corn," by Shoesmith—the three latter published by Orange Judd Company, 315 Fourth Avenue, New York City; "Corn Crops," Montgomery; "Elements of Agriculture," by Warren; "Cyclopœdia of American Agriculture," Vol. II; "Farm Crops," by L. H. Bailey—the three latter pub-

lished by the Macmillan Company, 64 Fifth Avenue, New York. (The complete set of the above encyclopœdia is the most valuable publication in America on all phases of Agriculture.) Farmers Bulletin-Circular, No. 19, "List of Publications of the Department of Agriculture Classified for the Use of Teachers"; No. 28, "Weeds and How to Kill Them"; No. 245, "Renovation of Worn-out Soils"; No. 257, "Soil Fertility"; No. 406, "Soil Conservation"; No. 192, "Barnyard Manure"; No. 278, "Leguminous Crops for Green Manuring"; No. 270, "Modern Conveniences for the Farm Home"; No. 438, "Hog Houses"; No. 303, "Corn Harvesting Machinery"; "The Use of Illustrative Material in Teaching Agriculture in the Rural Schools," (Year Book Separate, 382); "Some Problems of the Rural Commons School," (Year Book Separate, 233); "Beautifying the Home Grounds," (Farmers' Bulletin, 185); "The School Garden," (Farmers' Bulletin, 218); No. 408, "School Exercises in Plant Production"; No. 409, "School Lessons on Corn"; No. 423, "Forest Nurseries for Schools"; No. 428, "Testing Farm Seeds in the Home and Rural Schools"; No. 385, "Boys' and Girls' Agricultural Clubs"; No. 527, Year Book Separate, "Community Work in the Rural High School"; No. 104, Bureau of Plant Industry Circular, "Special Contests for Boys' and Girls' Club Work"; Farm Bulletin, No. 313, "Harvesting and Storing Corn"; No. 415, "Seed Corn"; No. 455, "Red Clover"; No. 318, "Cowpeas"; No. 537, "How to Grow an Acre of Corn"; No. 414, "Corn Cultivation."

And the maize-field grew and ripened,
Till it stood in all the splendor
Of its garments green and yellow.
—*Longfellow (Hiawatha.)*

INDUSTRIAL WORK CONNECTED WITH CORN

In connection with the study of corn a little industrial work for the pupils can be made very valuable, besides creating an interest that will go far toward solving the questions of discipline and compulsory attendance. Corn husks and corn stalks are frequently used to make useful articles for the household. In Colonial days many a door mat of husks served to wipe the feet of the sturdy pioneers, and could still be used to good advantage. Such mats would help to keep the school-room floor free from muddy tracks.

This work would make a splendid contribution by each district to send to the exhibit at the State Teachers' Assembly—arranged by Supervisor Brogden.

A number of books containing directions for "busy work" will be helpful in this connection; but, so as to have something definite and right at hand for each teacher, so that work may be started at once, I am copying the following clear and concise directions from "Teaching Agriculture in Rural and Graded Schools."

INDUSTRIAL WORK—ARRANGED BY MONTHS.

September.

Materials. Corn husks, raffia, cotton crochet or No. 30 cotton thread and small darning needles.

Collecting and Preparing Material. Select only the large ears from which to gather the husks. If small articles are to be made the husks should be pulled down from the ear and only the finer, well-colored ones taken out. If they are not to be used for some time, leave the outer husks for protection and store where they will not be exposed to the weather. Use the coarse, heavy ones for door mats.

Braided Mats. The directions given in any book on basketry may be followed, using the corn husks in place of raffia.

Braiding. Begin all braiding with the large ends of the husks. Fasten them together securely by wrapping tightly with thread, and tack to the desk or wall, or pin to the knee.

Keep the strands of even thickness and the braid flat and smooth.

Have the strands of uneven length so no two will need to be spliced at the same time.

Splicing. The splicing is done by braiding the large ends of the new strands along with the small ends of the old ones.

Width of Strands. In braiding, the width of the strands will depend upon the size and use of the mat to be made. Three-fourths of an inch is a good width for each strand in braiding a mat for small articles like a whisk broom holder.

Three Strand Braiding is the simplest and easiest, but the plaits resulting from the use of four or five strands are flatter and wider and therefore much better for mat work. The more strands there are to be spliced, the more difficult the work, but the result is worth the effort.

Four-strand Braid. Place the left-hand strand over the second and under the third strand. Place the right-hand strand over the second and under the third. Repeat until the braid is the desired length

SEWING THE BRAID.

Round Mat. Start with a small coil made by twisting the end back onto the braid. Call this the wrong side and hold it toward you. With a natural raffia or tan crochet cotton, sew the edge of the braid to the edge of the cord. Run the stitches in the direction of the twist of the braid, hiding them as much as possible. Continue the coiling and sewing until the mat is the desired size, then finish by fastening the end on the wrong side.

In some heavy articles, as heavy mats or baskets, it is better to overlap the edges of the braids. In this case use heavy cotton thread for sewing and take short, close stitches. To make thick, durable mats for the floor, sew the sides of the braid together with the narrow edges forming the surface.

Oval Mat. Bring three inches of braid (measuring from the end) around until its edge meets the edge running in the opposite direction; begin sewing where the edge is bent and hide the end of the braid with the next bend of the coil.

USES OF MATS.

These mats may be used as pads on which to set hot dishes, to place under fern dishes or flower pots as a protection to stands, or, if large enough, as seat or door mats.

OCTOBER.

Whisk Broom Holder. Make two mats the same size. Place the wrong sides together and sew the edges together, leaving five inches open at the top and an inch and a half at the bottom. Finish with a braid hanger.

Doll's Hat. Make a long braid, using strands one-half inch wide. Make the crown of the hat according to directions for a round mat. When the desired size, turn the braid at right angles and form the sides. When the crown is high enough make a second right angle to form the brim.

NOTE. After the pupils have had sufficient practice in braiding and sewing, the girls may make hats for themselves by following the directions for making a doll's hat. For a large hat use wider strands in the braid.

NOVEMBER.

One-piece Basket. To make the bottom, follow the directions for making a mat. The braid may overlap or be sewed to the edge. Form the sides by turning the sections of braid at right-angles to the bottom of the basket and sewing as before.

Square Baskets. Make six square mats of equal size. Sew together the edges of four of the squares to form the sides of the basket. Sew in the bottom and attach the cover, using ribbon or tape for hinges. Make a short loop of 3-strand braid and sew it in the center of the lid for a handle.

School Bag. Sew a long, slender oval of about three rounds of 4-strand braid for the base. Make the sides by sewing the braid at right angles to the

base and continue sewing round and round with the edges overlapped until the bag is the desired depth. Finish the top with an extra (double) round of braid, to give strength to the edge. Add two braided handles. The basket is much stronger if the handles extend down each side and across the bottom.

JANUARY.

DOLL FURNITURE FROM CORN STALKS.

Tools. Large, sharp pocket knife (or case knife), small bladed knife, pins (or glue) and ruler.

Materials. Choice and handling of: Select corn stalks which are smooth, solid, straight and mature. Use the thicker internodes, that part between the joints, for upright pieces and the smaller ones for round and cross pieces. For a chair four or five inches in height one-half inch is sufficient diameter for the largest pieces. To avoid extra disorder from rubbish have all leaves and waste material removed before stalks are brought into school room, and have all cuttings made over wide, shallow pasteboard box placed on each desk.

GENERAL DIRECTIONS.

Before beginning this industrial work have the older pupils, from measurements of furniture, work out the proportions for the dimensions of pieces desired for a doll house. Then plan all articles to be made, measure and cut all pieces, make holes for the rounds and fit all parts together. Have older pupils cut materials for children who are too small to handle a knife.

FITTING THE ROUNDS.

Accurately locate the best place for each round before making any holes, being careful that the holes are placed so that the rounds will run exactly parallel and at right angles. Plan the construction so that no two holes will come at the same height in one place. With a small blade cut each hole just the size of the round which is to fit into it and about half way through the stalk. Discard material which shows a tendency to split easily. The number of rounds will vary with the size of the furniture, but usually two on each side will be sufficient. A drop of glue may be placed in each hole before the rounds are fitted in, or the rounds may be held in place with pins. Drive them in at right angles to each round and snip off the ends, or drive them in opposite the side where the round enters the upright piece.

Bed. Material. Four large pieces for the posts, two medium-size long ones for the sides and four small ones for the ends.

Directions. Cut posts or foot of bed about a third shorter than ones for head. Determine the proper height for the sides and then make the rounds in the ends come one lower and one higher than side rounds. Follow general directions for fitting the rounds.

Chair. Material. Four pieces for legs, seven smaller ones for rounds and strips of outer covering of corn stalks for cane seat.

Directions. Cut the back legs long enough to form the upright parts of the back of the chair. Make the front legs just the height of the seat. Follow general directions for cutting and fitting pieces except for the front end of the upper side and rounds. These pieces form the sides of the chair seat and

instead of being fitted into a hole, are made to fit the top of the front legs by means of a notch in each. Make each notch two-thirds of the diameter of the leg. Lay a strip cut from the outer covering of corn stalk across the front and resting on top of front legs. Fit notches in place and run pins down through to hold. Make the cane seat as follows.: Make slits one-fourth inch apart on inner side of each upper side round. Cut narrow strips from the outer covering of a corn stalk and make the cross pieces of the seat by fitting these into the slits. Weave similar strips through these from front to back and hold in place with a drop of glue at each end. A couch may be made by following these directions for making the cane seat. Encourage children to work out other designs and plans for chairs.

Table. A table may be made by the small children. It consists of four legs held together by a round or two on each side and a stiff piece of cardboard for the top. The latter is held in place by running long pins down through into the legs.

Make book shelves by fitting cardboard into deep, narrow notches cut in four upright posts. After a little practice pupils can work out plans for other pieces, and a doll house furnished which will delight the heart of any child.

See that all the work is done accurately and neatly.

The husky, rusty russel of the tossels of the corn,
And the raspin' of the tangled leaves, as golden as the morn;
The stubble in the furries—kindo' lonesome-like, but still
A-preaching sermuns to us of the barns they growed to fill;
The strawstacks in the medder, and the reaper in the shed;
The hosses in theyr stalls below—the clover overhead!—
O, it sets my heart a-clickin' like the tickin' of a clock,
When the frost is on the punkin and the fodder's in the shock!

—*James Whitcomb Riley.*

A NORTH CAROLINA BOY'S CORN FIELD.

A BEAUTIFUL PLANT

How straight and tall and stately stand
  Its serried stalks upright and strong!
How nobly are its outlines planned,
  What grace and charm to it belong!
What splendor in its rustling leaves!
  What richness in its close-set gold!
What largess in its clustered sheaves,
  New every year, though ages old!

—Celia Thaxter.

[From "The Nebraska Corn Book."]