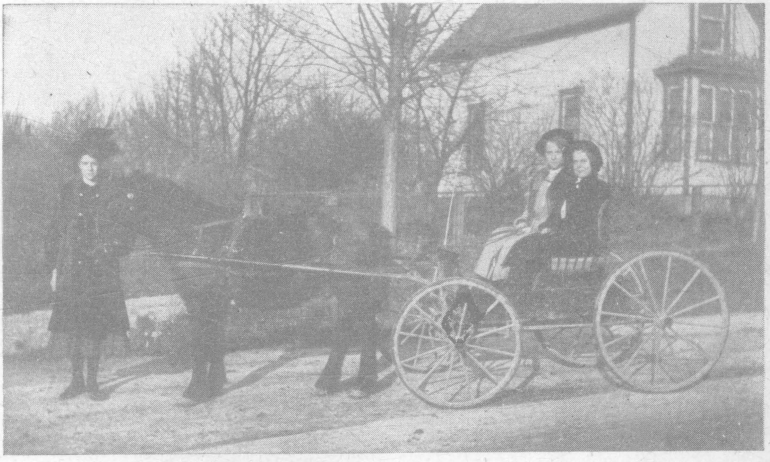
# The Agricultural College

## EXTENSION BULLETIN

VOLUME II MARCH, 1907 NUMBER 7


# IMPROVEMENT OF THE CORN CROP


JAMES A. FOORD, Associate Professor of Agronomy

OUR PET BILLY.

This is the way for Billy and—us three.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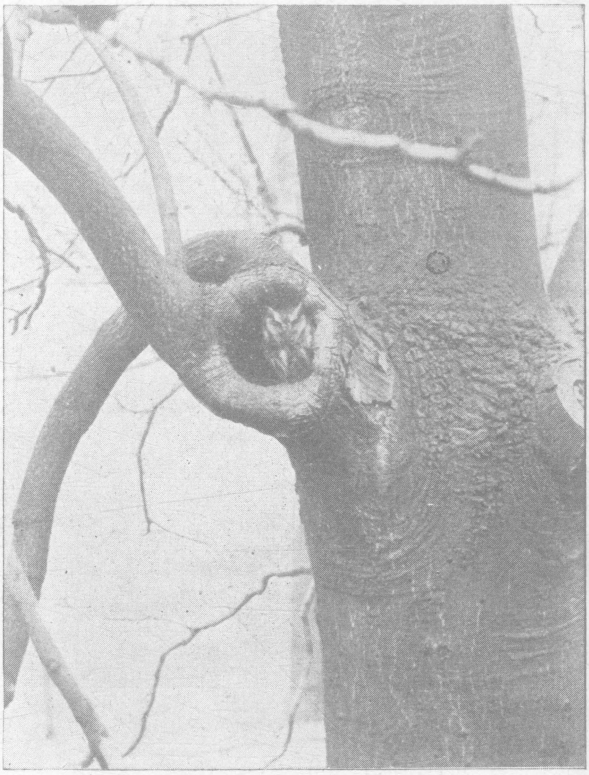


THE EARLY OWL.

# THE EARLY OWL

An Owl once lived in a hollow tree,
And he was as wise as wise could be.
The branch of learning he didn't know
Could scarce on the tree of knowledge grow;
He knew the tree from branch to root,
And an Owl like that can afford to hoot.

And he hooted until alas! one day
He chanced to hear, in a casual way,
An insignificant little bird
Make use of a term he had never heard.
He was flying to bed in the dawning light
When he heard her singing with all her might:
"Hurray! hurray! for the early worm!"
"Dear me," said the Owl, "what a singular term!
I would look it up if it weren't so late.
I must rise at dusk to investigate.
Early to bed and early to rise
Makes an Owl healthy, and stealthy, and wise!"

So he slept like an honest Owl all day,
And rose in the early twilight gray,
And went to work in the dusky light
To look for the early worm at night.
He searched the country for miles around,
But the early worm was not to be found;
So he went to bed in the dawning light
And looked for the "worm" again next night.
And again and again, and again and again,
He sought and he sought, but all in vain,
Till he must have looked for a year and a day
For the early worm in the twilight gray.

At last in despair he gave up the search,
And was heard to remark as he sat on his perch,
By the side of his nest in the hollow tree:
"The thing is as plain as the night to me—
Nothing can shake my conviction firm;
There's no such thing as the early worm."

—*Oliver Herford.*

# IMPROVEMENT OF THE CORN CROP

JAMES A. FOORD, Associate Professor of Agronomy

Someone forgetting the many new uses that are being found for corn will say improvement means more corn, and more corn means lower prices. Even if we admit this very doubtful statement, improvement is still desirable for it means the same amount of corn on one-half the area, which in turn means reducing the labor account nearly one-half and consequently increasing the profits by that amount. The average yield of corn in Ohio in 1906 was slightly over 42 bushels per acre, but many good farmers raised 80 and 90 bushels per acre on large areas, and these farmers do not believe they have reached anything like a maximum yield.

SCORE CARD FOR DENT CORN

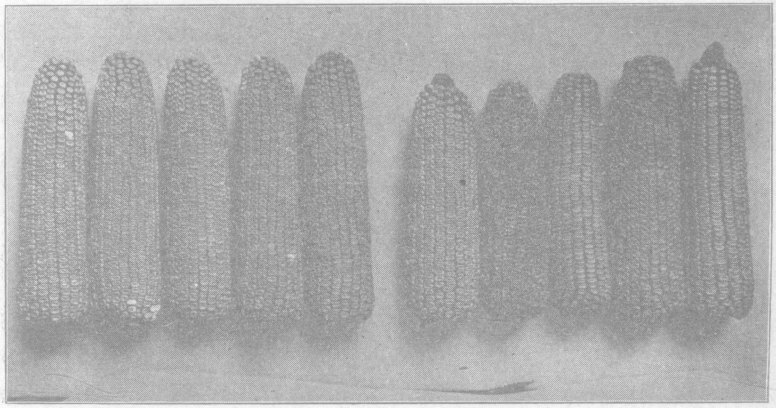
| | | |
|---|---|---|
| 1 | Uniformity of ears as to shape, color, indentation and size of kernel | 15 |
| 2 | Maturity and seed condition | 15 |
| 3 | Shape of kernels and size of germs | 15 |
| 4 | Weight of ears | 15 |
| 5 | Color; grain and cob | 5 |
| 6 | Space between rows | 5 |
| 7 | Length | 10 |
| 8 | Circumference | 5 |
| 9 | Butts | 5 |
| 10 | Tips | 5 |
| 11 | Per cent. of grain | 5 |
| | | 100 |

One of the important factors in the improvement of the corn crop is good seed. In the Agricultural College Extension Bulletin published last September many good suggestions were given by Mr. C. G. Williams, the Agronomist of the Agricultural Experiment Station at Wooster on the Selection of Seed Corn. The author pointed out the advantages of selecting seed corn in the field before the stalks were cut, so that the ears chosen, in addition to being good ears, should come from good plants, for the entire corn plant is the individual unit with which we must deal in our efforts to improve the product.

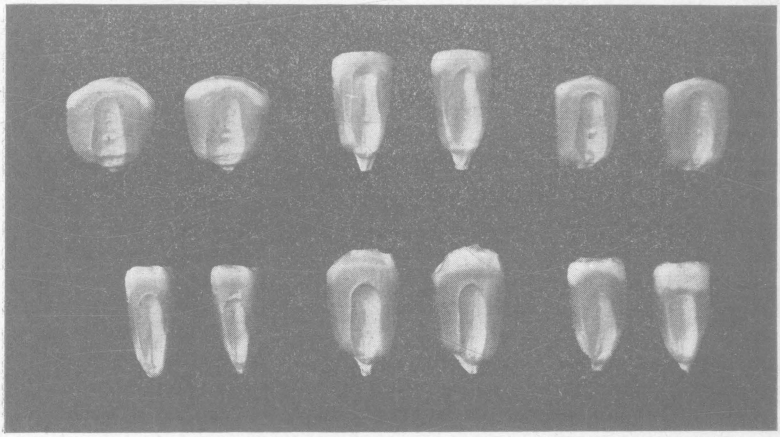
Probably the most important reason for selecting seed of any kind directly from the plant is that the conditions under which it grew (sometimes called its environment) may be known and considered. If 3300 corn plants grew on an acre of ground and produced 3000 ears of corn each weighing a pound, some very good looking seed might be obtained. A thoughtful farmer, however, would hardly expect to obtain the same percentage of one pound ears from this good looking seed the following year if it were planted at the rate of 10,000 plants—or practically three times 3300—per acre, unless the supply of fertility or moisture or both were materially increased. Our seed corn then should be chosen from plants that have proved their ability to produce good ears of corn under the same conditions of crowding and culture as the general field crop.

## THE SCORE CARD

To aid in making a still more careful selection of seed ears from those picked in the field, or even from those saved at husking time, a score card has been arranged. The chief value of this score card or any score card is to call attention to the different parts or points that go to make up a perfect whole. Too much importance should not be given to the numerical percentages assigned to the different points. As many questions have been asked about the score card, the following brief suggestions for its use are given.



The five ears on the left show uniformity, those on the right do not, aud are undesirable for that reason, if for no other.



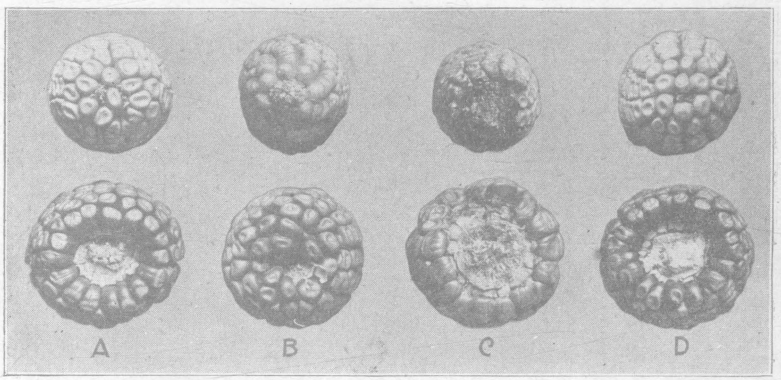
A B C

The two kernels in the center are the best. The two outside grains at each end of the upper row are too short. The two outside ones in the lower row are too pointed at the tip, showing lack of vitality.

Uniformity of ears in shape, size, color, and indentation is desirable; the more uniform all the ears in a cornfield are, the more nearly will they ripen at the same time and the less soft immature corn there will be. Uniformity also shows that careful selection has been practiced in preceding years. Uniformity of kernel contributes to the uniformity of ears and is essential if machine planting is practiced in order that the desired number of kernels may be dropped in each hill.

Maturity is very important and this applies to nearly all seeds. In corn, solidity and a bright, live color, are indications of maturity and good seed condition. Corn that is loose on the cob was probably immature when it was harvested and should be discarded.

In considering the shape of kernel two things should be kept in mind: (1) a corn cob is nearly round, and (2) we want as much mature corn per ear as possible. If this is done the reasons for choosing kernels like B (Fig. at bottom of page 5) instead of A and C are evident.




Upper row. Tips: A, well filled, good; B, pointed with pearly flint-like grains, bad; C, not covered and injured by smut fungus, bad; D, well filled with regular rows, but a little too pointed, good.

Lower row. Butts A and D, medium sized shanks, well filled, good; B, shank not large enough to support the ear, bad; C, shank too large and not well filled with grain, bad.

The germ or embryo should be large, smooth, and of a clear, light color. Large because large germs make strong plants (plant separately 100 kernels with large and small germs and see for yourself), also because the germ is rich in oil, mineral matter, and protein (or albuminous matter). The germ can easily be taken from the rest of the kernel for study if the grain has been soaked in warm water for half an hour. Freezing temperatures before the grain is mature, mold, and other things that injure the vitality or life of the seed cause the germ to wither or wrinkle, and turn dark colored. Ears having grains with germs of this kind should be discarded.

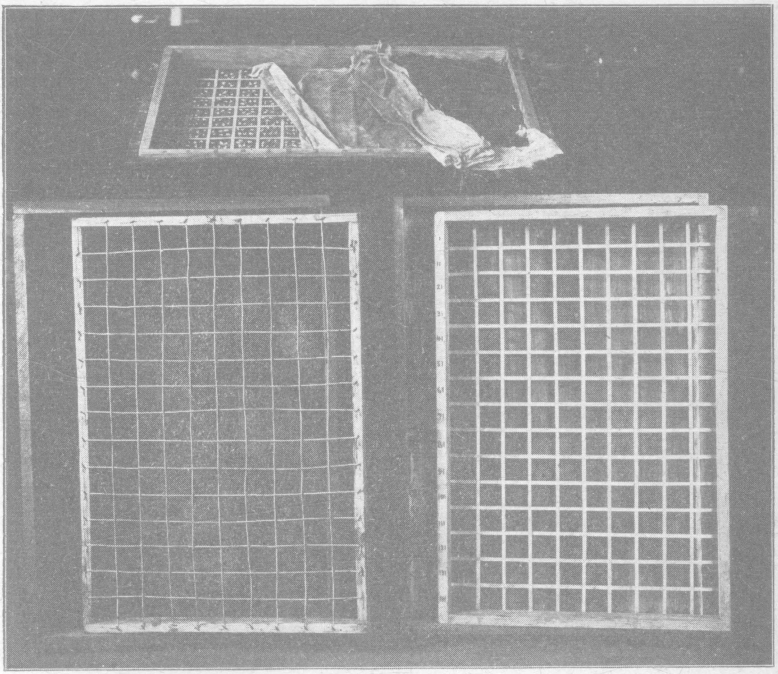
Weight of ears, length, and circumference have all been discussed in the article referred to above (See September number of the BULLETIN) and need no further explanation here.

Coming to less important points, the color should be pure and unmixed, yellow with red cobs for yellow corn, and white with white cobs

for white corn; mixed colors, or even shades of color are objectionable because they indicate a mixed corn due to cross-pollination between different varieties.

The tip of the ear should be well covered with grain, and the kernels should be deep and arranged in regular rows like those found at the middle of the ear. These characteristics should also be found at the base of the ear, surrounding a medium sized shank or stem, if a perfect score of five points is to be awarded.

Per cent of grain is the relation of the weight of shelled corn to the gross weight of the ear before shelling, and is frequently misunderstood.



THREE GERMINATORS FOR TESTING SEED CORN.

The upper one is in operation. The sand is pushed back to show corn in place. The two lower ones show construction. Zinc strips are used in the one on the right. Wire is used in the one on the left.

The legal weight of a bushel of corn on the ear in Ohio is 68 lbs. and of shelled corn 56 lbs. If a bushel of ears weighing 68 lbs. yields 56 lbs. of shelled corn it means that the ears were slightly over 82 per cent of grain. While many varieties yield a higher per cent of grain than this, it is not of particular importance, for the corn that yields the highest per cent of grain seldom produces the largest actual amount of shelled corn per stalk or per acre.

## THE GERMINATION TEST

The seed ears saved after careful inspection aided by the use of the score card must now be put to the final trial—the germination test.

For small amounts of seed two pieces of moist cloth or blotting paper placed between two dinner plates to keep the moisture from evaporating may be used. Almost anything that will hold moist sand can also be used, but for general farm use something like those shown in the figure on p. 7 is most convenient. The apparatus is simple and can be made by anyone who can use a hammer and saw. It consists of a shallow wooden tray or flat 2¾ inches deep in which moist sand is placed to the depth of nearly two inches (sawdust may be used but sand is more nearly like field conditions). Fitting loosely into this tray and resting upon the sand is a frame made of 1½ or 2-inch strip lumber on one edge of which is nailed either ¼-inch strips of zinc or small sized galvanized wire; whichever is used should be woven as shown in the illustration. The frame is 20 by 30 inches inside measurement and the strips are placed every two inches, thus dividing the space into 150 little squares each nearly two inches on a side. These squares should be numbered from one to ten across the twenty-inch side; eleven, twenty-one, thirty-one, etc., will then come directly below one and similarly fourteen, twenty-four, thirty-four, etc., below number four. If this arrangement is followed only the numbers one, eleven, twenty-one, etc., need be placed on the edge of the frame; all other numbers can be readily found from these.

The ears to be tested should then be numbered or placed in a row and six kernels taken from different parts of each ear and placed, germ up, in the corresponding square in the germinator.

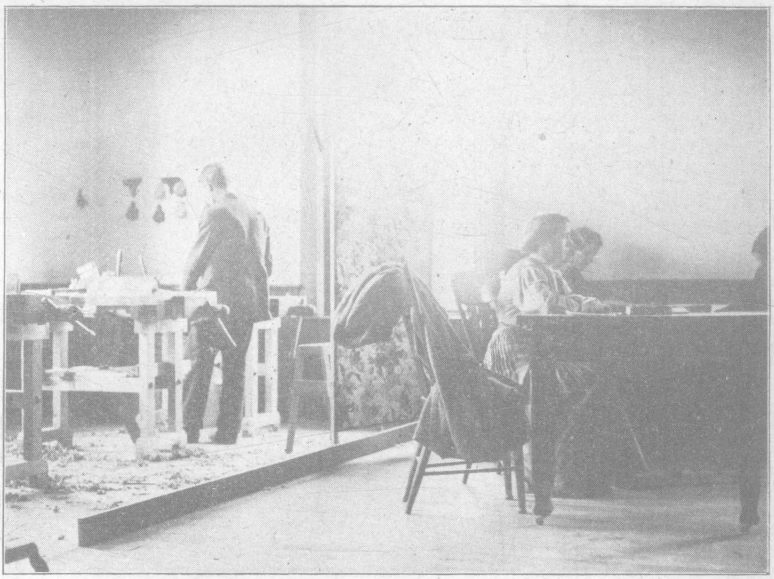
Two separate pieces of white cheese cloth, or any thin cloth, that has been dipped in water should then be spread over the corn and on top of these an inch of moist sand; the whole thing should then be kept in a warm room. It is well to put a chemical or dairy thermometer between the two layers of sand; the temperature should be kept between 60° and 70° F. The time required for the corn to sprout depends on the temperature and moisture, but, as a general rule, all ears should be refused for seed purposes that do not show germination of all the kernels by the end of the fifth day. The ears that show perfect germination are then ready for the field, except that for machine planting the irregular sized kernels at the tip and base of the ear should be discarded.

If the above suggestions are followed a more even and complete stand of plants will be obtained in the cornfields of Ohio, and when this has been accomplished the yield will be increased and the cost of production reduced, for it costs just as much to plow, prepare for, and cultivate an acre of corn with one or two stalks in a hill as it does if there are three stalks; and experiments covering several years show that three stalks will produce the most marketable corn under Ohio conditions. If the boys and girls who read this will make a few simple calculations it may add to their interest in the subject, and provide some interesting questions. Calculate the number of stalks per acre when corn is planted according to the custom in the township in which you live, then weigh a few medium sized ears of corn, and determine what the yield would be if 90 per cent of the stalks produced one of these medium sized ears. Why is the average yield of corn in Ohio less than 43 bushels per acre?

# THINK, THEN DO

The field seeds that are sent to boys and girls are not just to satisfy a fancy. They are not worth planting if the desire is only to raise something larger than has been raised. The best ear of corn is not always the largest. The size and shape of the grains, the arrangement of the rows, the relation of the distance around to the length of the ear are also points to be considered.

A large beet may not be the one that contains the most sugar; a large head of cabbage may be a bunch of loose leaves; and a large potato may be a black hearted one. Size alone doesn't always mean much. There must be other qualities.



THINKING AND DOING COMBINED.

Three work benches in recitation room of high school at Grove City, Ohio. Benchas screened from the class. Skill for the hand, culture for the mind.

We must all learn that spading and plowing do more than loosen the soil for the roots of plants. If water and air are necessary plowing does much to prepare the soil to receive them. We must learn also that rolling and harrowing do more than break and crush clods. It is necessary to make the soil fine and firm, that more film may be retained and that during very dry weather more water may come upward from the ground lying below that which has been plowed. A firm soil, not a solid soil, makes a better place for the plant to take root. Have you observed that petunia and lettuce seeds are pressed firmly against the soil that they may take root more easily?

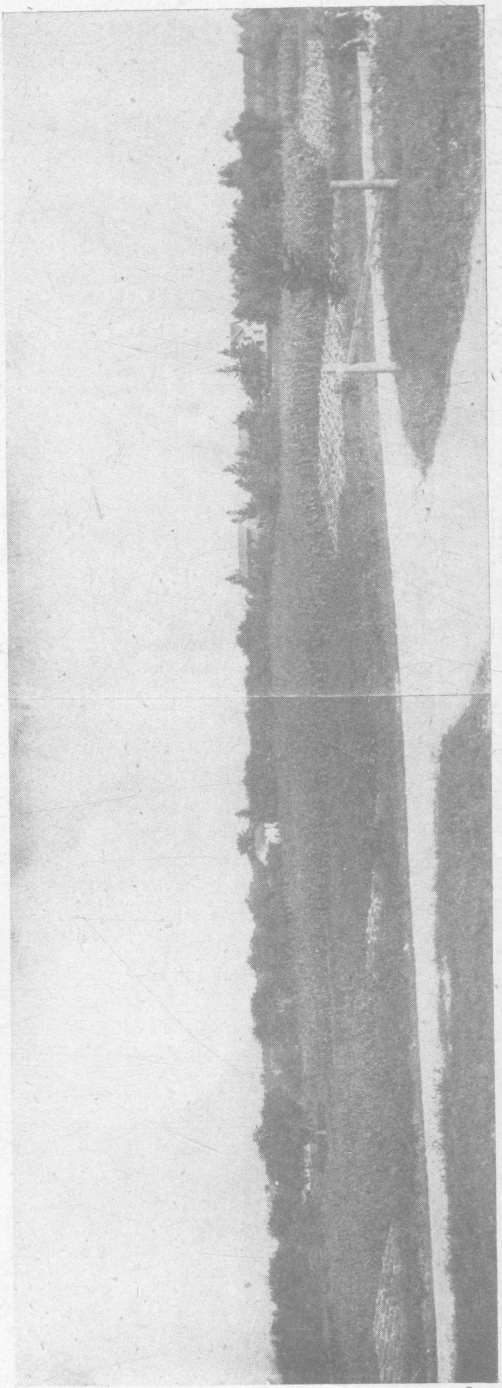
Cultivation does more than tear out grass and weeds. It does quite as much for the plant in loosening the upper soil that has become solid or crusted that air may enter the soil and that a soil mulch may be prepared to prevent too rapid evaporation or loss of water.

Turning over the upper soil by plowing, crushing and breaking clods by rolling and harrowing, and tearing out weeds by cultivating are processes that impress us first because we can see them being carried on.

The preserving of film water in the soil, the improvement of conditions to control soil heat and ventilation are best learned by the use of soil, cans, boxes, etc., that are used in making tests or experiments. Don't read about them —Use them.

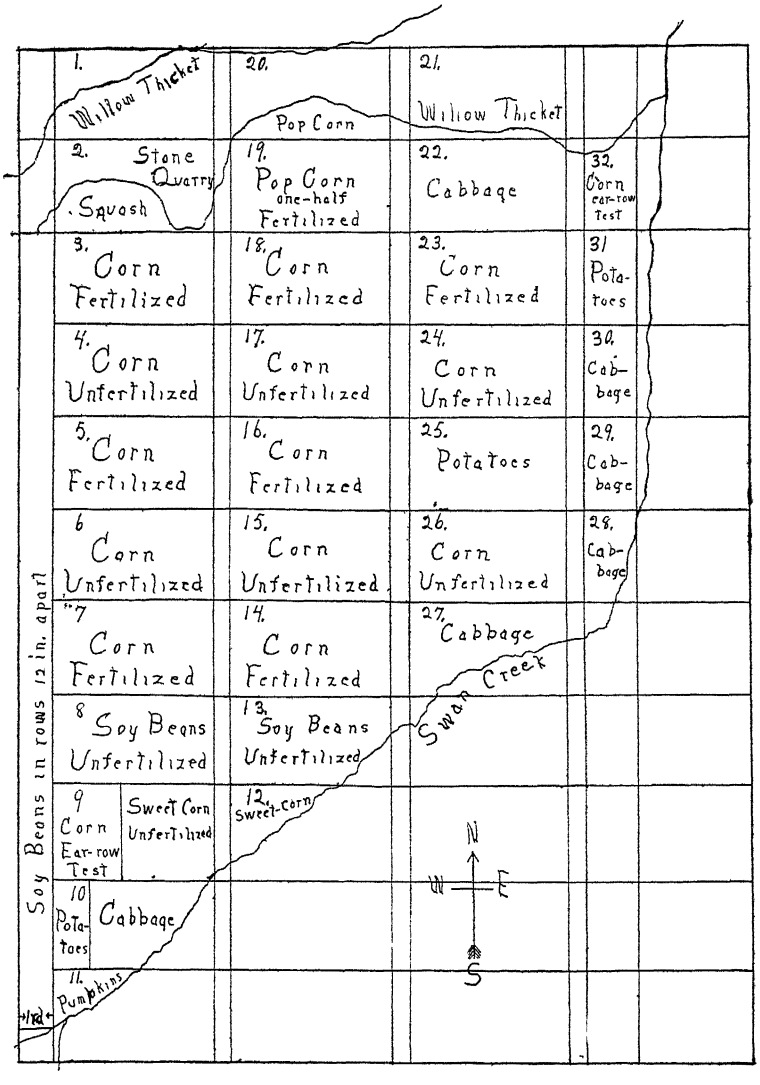
When the experiment has answered your question, use the tilling and cultivating instruments —plows, spades, rollers, hoes, rakes, drags, harrows, etc., in such a way and at such times that you may do what is best to make the plant grow.

Many of our boys and girls last season planted very small seeds too deep. It is about as difficult for seeds that are planted too deep to get up through the ground as it is for a boy that is several feet under a snow bank to dig his way out. The result in either case might be the same: each would have to give up and die. When you plant small seeds think about whether they have vitality to get through the cover of soil you place over them.



Test plats used by High School pupils in Monclova township, Lucas county, Ohio. Another example of thinking and doing—culture and skill.

Small seeds usually need only to have the ground and seed stirred either with the fingers or a rake. Some need only to be pressed firmly against the soil that they may absorb dampness from it. If the soil is very dry, as it sometimes is when grass and other small seeds are sown, place a very thin coating of fine chaff—straw or something of that kind—to protect the ground from the hot sun. This little shade and protection will retain enough dampness to sprout the seed and start the plant to grow. Petunia, lettuce, and all kinds of grass seed can be made to grow where under ordinary conditions nothing will appear.

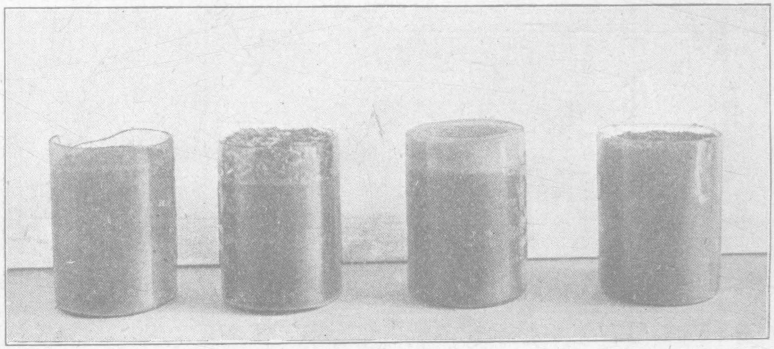



MAP OF TEST PLOTS, MONCLOVA TP. HIGH SCHOOL. (See opposite page.)

# SEED AND MULCH EXPERIMENTS

Knock out the end of a chalk box. In place of the lid to the box insert a piece of window pane, cut the same size as the box lid. Against the glass plant two beans in rich dirt. Place one seed near the bottom and the other about two inches below the surface. Water well. Will both reach the surface? Why?

Cut the side from a rectangular oyster can or any other can of that shape, or use another chalk box, and place a glass in one side. In each can or box place the same kind of soil. After beans or corn are planted at the same depth, say two inches, press the dirt down rather compactly in one. Put the same quantity of water on each. Which comes up first? Why?



1 2 3 4

*(From Goodriches First Book of Farming. Used by by permission of Doubleday, Page & Co., New York.)*

1. Packed soil lost in 7 days 5.5 oz. water.
2. Packed soil, covered with straw, lost in 7 days 2 oz. water.
3. Packed soil, covered with sand, lost in 7 days 0 oz. water.
4. Packed soil, covered with soil mulch, lost in 7 days 2.5 oz. water.

In three boxes or flower pots place as rich soil as you can find. After the soil in each box has been dampened with the same quantity of water allow them to stand for an hour or two. Cover the soil in one with one inch of sand; on another place some loose soil of the same kind used in the box; allow the third to remain. At the end of a week dig down into each one and find out which contains the most moisture.

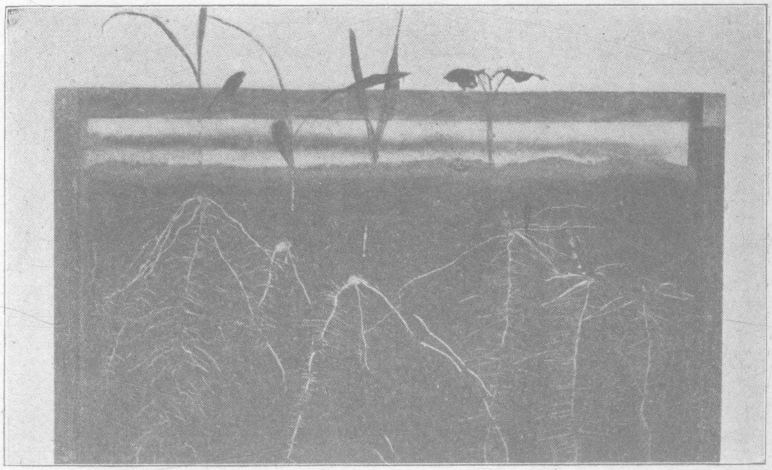
# OUR BIRD NEIGHBORS

The bird list printed in this bulletin means nothing if no use is made of it. Many boys and girls read or hear read descriptions of birds. A sheet or two from a tablet is used to reproduce what is fresh from the printed page. The pictures in the book are the only birds that many children can recognize. Probably that is because these birds are perfectly quiet.

It is not supposed that teachers or boys and girls will learn to recognize all birds; but to become somewhat acquainted with those that fre-

quent our gardens, door yards, and fields is quite enough for several months if not for years. The lifeless book may assist one in learning about living birds. Use your eyes to learn their color, how they fly, how they move over the ground, where they nest, etc. Use your ears to learn their call and song. No book can describe clearly many things one must learn by seeing and hearing. How dead the bird in the nature book! How full of life the little songster in the tree!

There may be a bird picture on these pages occasionally, but this is not to be a bird book. Send your bird descriptions to us if you cannot learn their names, as many teachers and children already have done. Teachers and books will help you. What either tells us will not take the place of what we should learn ourselves.



1 2 3 4 5 6 7 8

*(Used by permission of Doubleday, Page & Co.)*

TO SHOW HOW DEEP SEEDS SHOULD BE PLANTED.

1 and 5 did not sprout. Not deep enough to get moisture. 2, 3 and 4 of corn and 6 of Beans succeeded in getting through. 7 and 8 were unable to get through the soil cover.

Don't study our common birds as though they were some animal in a far off land. The bird you find in your school poems or nature book may be singing just outside the window.

Begin with the bird you know best and watch it now and then from the time it comes in the spring until it leaves in the fall. You may find difficulty in telling which one you know best. It is no discredit to begin with the English sparrow. With the coming of the robin, bluebird, and song sparrow, the English sparrow will find himself in a company upon whose honor roll his name may not appear first.

Let me ask you a few questions to find whether or not you have used your eyes and ears:

Have crows, woodpeckers, and bluejays been here all winter?

What do woodpeckers eat? How do they secure their food?

Which appear first, bluebirds or robins?

Does the robin or bluebird sing while flying?

Does the robin usually break a fishworm when pulling it from the ground?

How do robins frighten away intruding bluejays?

What harm can a bluejay do at a robin's nest?

Why doesn't it harm a bluebird's nest?

Do the birds mentioned in the last questions build their nests as high as crows and hawks build?

What do our spring birds eat?

How many different songs or calls have you heard blue jays make?

Will the robin sing the same song next fall that he sings this spring?

. . Where does the song sparrow build its nest?

. . What bird builds its nest on high elm limbs?

. . What birds can descend trees head downward?

. . Do both the male and female bluebird work at building a nest?

. . Would you care to have these questions answered for you? There is where much of our trouble lies. We are told too much; we must learn to see more.

## AN OHIO BIRD LIST

Do you know them by their form and color, their song, or their flight? Make a little cross in front of the name of each bird you know.

Blackbird (red winged).
Blackbird or common Grackle.
Bluebird.
Bobolink.
Bob-white.
Butcher-bird.
Cat-bird.
Cedar-bird.
Chickadee (black capped).
Cow-bird.
Crow.
Cuckoo or rain crow.
Dove (turtle or mourning).
Finch or lettuce bird.
Flicker.
Grossbeak (cardinal or red-bird).
Hawk (sparrow).
Humming-bird.
Indigo-bird.
Jay.
Junco or Snow-bird.
Killdeer or Killdee.
King-bird.
Kingfisher.
Lark (meadow).
Martin (purple).
Oriole.
Owl.
Pewee or Phoebe bird.
Robin.
Sandpiper.
Sapsucker.
Shrike or Butcher-bird.
Sparrow (chipping).
Swallow (barn).
Swift (chimney).
Thrasher (brown).
Towhee or Chewink.
Vireo.
Whip-poor-will.
Woodpecker,
(downy, red-headed, flicker).
Wren (house).

These are common Ohio birds. Save the list until next fall and see how many you can add to what you now know.

Let us classify a few as to their nesting places.

*Ground Builders:* Meadow lark, Bob-white, Whip-poor-will, Killdeer; Kingfisher (in a hole in a bank).

*Bush Builders:* Red-winged blackbird, Catbird, Chipping sparrow.

*Tree Builders:* Wood thrush, Robin, Oriole, Cedar-bird, Snow-bird, Bluejay, Dove, Humming-bird, Crow, Vireo.

*In Holes in Limbs;* Red-headed woodpecker, Sparrow, Hawk, Sapsucker or Downy woodpecker, Bluebird, Wren.

*Box Builders;* Bluebird, Wren, Purple Martin.

*Barn and House Builders:* Barn swallow, Chimney Swift or swallow.

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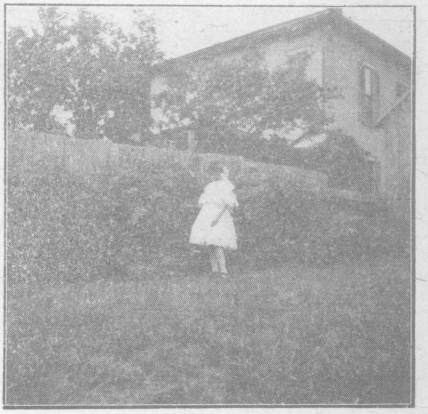
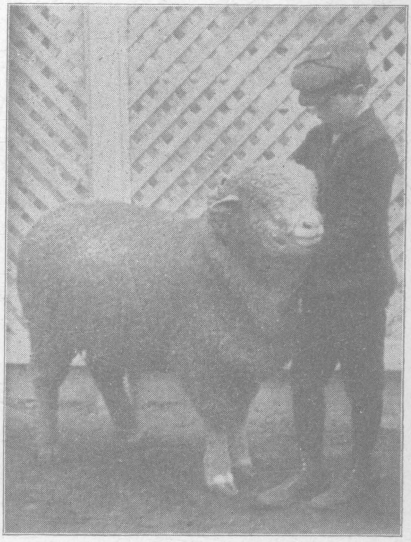


Alice Dial and her pony, near Batavia, O.

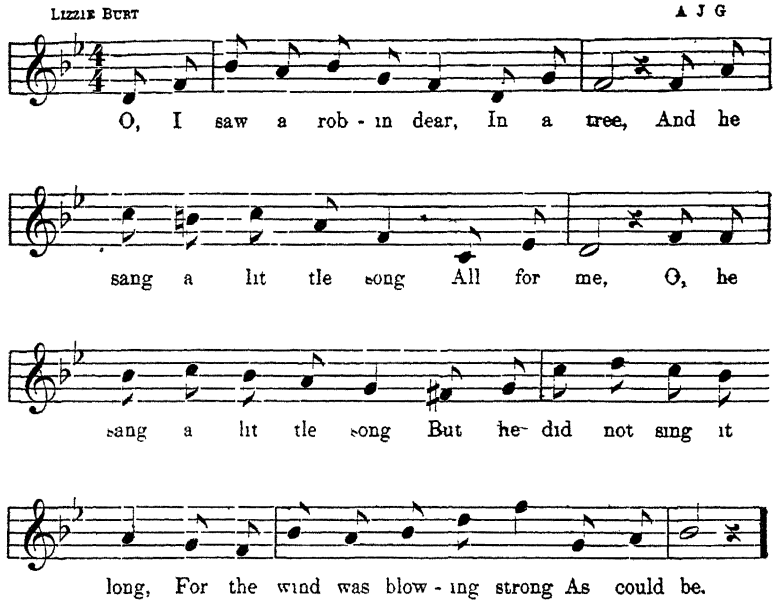


Charles Chapman and pet lamb, near Marysville, O.

A PAGE OF PETS.

# THE FIRST ROBIN

LIZZIE BURT A J G




2 And it blew him far away, Out of sight,
And the snow was falling down, Thick and white,
Oh! it blew him far away! And I did not care to play,
Any more at all that day, Until night

3 When at night I said my prayer By my bed,
I remembered what in church Once was said,
How God listens to each word So I told Him of the bird,
And I'm very sure he heard What I said

4 For the snow soon went away And at dawn
Little robin hopped about On the lawn,
And he sang a jubilee In the crooked appletree,
For the winter, don't you see? It was gone —