SCHOOL HOME GARDEN CIRCULAR NO. 13. DECEMBER, 1916.

DEPARTMENT OF THE INTERIOR.

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GARDEN PROJECTS IN SEED PLANTING.

This circular is intended for teachers who are conducting home-garden work. Its purpose is to outline lessons on seeds that will show the children the necessity of a good seed bed and enable them to sow seeds more intelligently. Special emphasis should be placed on the importance of good seeds.

FIRST PROJECT: HOW DO YOU PLANT SEEDS? The answer depends upon a knowledge of the following: What do seeds need to germinate? How deep are seeds planted? Are seeds planted the same in all soils?

I. What do seeds need to germinate?

Material needed for a group of four children:

Three 8-ounce wide-mouthed corked bottles.

Beans, peas, and corn seeds soaked 2 hours.

Beans, peas, and corn seeds soaked 24 hours.

A piece of white cloth 5 by 10 inches.

Directions for making the experiment:

Let one group of children use beans, another group peas, and a third group corn.

Place the seeds between the cloth to remove the surplus water.

Put in a bottle a few bean seeds that have been soaked for 2 hours. Cork.

Put in a bottle a few bean seeds that have been soaked for 24 hours. Cork.

Fill the third bottle three-fourths full of bean seeds soaked 24 hours. Cork.

Place the bottles in groups in a warm place with the exception of one set. Place this in an ice box.

In two to three days the seeds that have been soaked 24 hours should have sprouted in the bottles containing only a few. The experiment is now ready to be explained.

Place the bottles in sets so they can be observed by groups of children.

Which seeds have sprouted? Why?

Lower a lighted taper into the bottles that are three-fourths full of seeds to assist the children in determining why the seeds did not sprout.

To determine the presence of carbon dioxide, place a small vial containing limewater in a bottle three-fourths full of bean seeds. Cork the bottle and put it in a warm place. In a few hours the limewater will have a milky appearance, indicating the presence of carbon dioxide. Let children breathe into test tubes containing limewater.

Where does the carbon dioxide come from?

The experiment should illustrate these facts:

Seeds need to be thoroughly soaked to germinate.

They need a certain amount of air and heat.

Material needed for a group of four children:

Beans, peas, and corn seeds soaked 24 hours.
One tumbler of moist garden soil.
One tumbler of dry garden soil.
One tumbler of puddled clay.

Directions for making the experiment:

Plant 1 inch deep, in a tumbler of moist garden soil, three beans that have been soaked for 24 hours.

Plant 1 inch deep, in a tumbler of dry garden soil, three beans that have been soaked for 24 hours.

Plant 1 inch deep, in a tumbler of puddled clay, three beans that have been soaked 24 hours.

Cover the soil in the tumblers with paper.

Let the other groups of children plant peas or corn.

Plant the peas 1½ inches deep and the corn 2 inches deep.

Place the tumblers in groups in a warm place with the exception of one set. Place one set in an ice box.

In three to four days the seeds planted in the tumblers containing moist garden soil should have sprouted.

The experiment is now ready to be explained.

Place the tumblers in sets so they can be seen by groups of children.

Why have the seeds sprouted in the moist garden soil?

What condition for germination was lacking in the dry garden soil? In the puddled clay? In the soil in the ice box?

The experiment should illustrate this fact:

Seeds need to be planted in a fine, warm, moist soil to germinate quickly.

(For means of making the soil fine, warm, and moist, see School Home-Garden Circular, No. 7.)

Question: Do all seeds need the same degree of soil temperature to germinate?

Group garden vegetable seeds as follows: Those that can be planted in the early spring soil; those that can be planted in middle spring soil; and those that need the warm summer soil.

II. How deep are seeds planted?

Material needed for a group of four children:

Four tumblers.
One saucer of radish seed (or any small seed).
One saucer of beans, soaked for 24 hours.
One saucer of peas, soaked for 24 hours.
One saucer of corn, soaked for 24 hours.
One dish of moist garden soil.
Four tin tablespoons.

Directions for making the experiment:

Let one child plant beans, another peas, another corn, and the fourth radish.

Put 2 tablespoonfuls of soil in the bottom of the tumbler. Press the soil.

Place a bean against the side of a tumbler so that germination can be watched.

Put two tablespoonfuls of soil in the tumbler. Press the soil.

Place another bean against the side of the tumbler a little to the right of the other seed.

Repeat until the tumbler is full of seeds planted in a spiral fashion. Care should be taken that the seeds are not planted on top of each other.

Cover the soil in the tumbler with paper.

Put the tumblers in a warm place.

In four to five days the seeds will have sprouted and some of them reached the surface.

Now place the tumblers in sets so they can be seen by groups of children.

Why can corn be planted deeper than peas?

Why can peas be planted deeper than beans?

How deep should radish seeds be planted? Why?

The experiment should illustrate these facts:

The depth to plant seeds depends upon the fineness of the soil particles, the amount of moisture, and the temperature of the soil.

Small seeds should be planted about ¼ inch deep. They should be planted somewhat thickly, in order that the strength of all will enable the tender plantlets to reach the surface.

Large seeds are planted at varying depths, depending on whether the food is stored in the endosperm or in the seed leaves, and whether the seed leaves are brought above the surface or left in the soil. Corn, in which the food is stored in the endosperm, may be planted 4 inches deep. Peas, in which the food is stored in the seed leaves that are left in the soil, may be planted 2 inches to 3 inches deep. Beans, in which the food is stored in the leaves that are brought above the surface, should be planted 1 inch to 1½ inches deep; otherwise the seed leaves will be torn off while coming through the soil and the plant will be stunted.

To show the importance of the materials stored in the seeds, make the following experiments:

Material needed for a group of four children:

Three 8-ounce wide-mouthed bottles seven-eighths full of water.

Three pieces of absorbent cotton.

Two corn plants 4 days old.

Two pea plants 4 days old.

Two bean plants 4 days old.

Directions for making the experiment:

Let one child in each group use corn, another peas, and a third beans.

Remove the endosperm from one of the corn plants.

Wrap the two corn plants in absorbent cotton.

Place the plants in the bottle of water so that the roots are in water.

Remove the seed leaves from one of the pea plants.

Wrap the pea plants in absorbent cotton.

Place the plants in the bottle, so that the roots are in water.

Treat the bean plants the same as the peas.

Place the bottles in a warm, sunny place.

In three or four days the perfect plants should have grown more than the other plants.

Now place the bottles in sets so that they can be seen by groups of children.

What does a seed contain?

How much material is stored in the seed?

What kind of material is stored?

How can the plant make use of the material?

The experiment should illustrate these facts:

The seed contains an embryo plant and enough material to supply growth until the plant becomes well established in the soil.

During germination these materials, such as minerals, fats, proteins, and sugars are changed into more simple products which are carried through the plant and used in growth.

SECOND PROJECT: HOW CAN YOU TELL GOOD SEEDS? The answer depends upon a knowledge of the following: What is the germinating test? How carefully were the seeds selected?

What is the germinating test?

Material needed:

Two plates.

One piece of cloth 4½ by 9 inches.

Seeds.

Directions for making the test:

Moisten the cloth.

Spread one-half the cloth in the center of the plate.

Place 100 small seeds on the moist cloth.

Cover with the other half of the cloth.

Cover all with the other plate.

Put in a warm place.

Keep cloth moist, but not wet.

Let the children test different vegetable seeds. In testing seeds, use the following quantities: 100 for all small seeds; 50 for all large seeds except 25 each for peas and beans; special method is required for testing beet "balls," each of which may contain from one to seven seeds.

In three to five days many of the varieties of seeds will have sprouted.

Now place the plates where the children can use them.

Compare the size and strength of the plantlets of seeds of the same varieties.

Count the number of seeds that have germinated

Calculate the percentage of good seeds.

The experiment should illustrate these facts:

Some seeds germinate quicker and produce stronger plantlets than other seeds of the same varieties. Such seeds will produce better plants.

The tests should agree with the standards of germination. With beans, cabbage, mustard, peas, and radish from 90–95 should germinate out of every 100. Corn, cucumber, lettuce, melon, pumpkin, squash, and tomato, from 85–90. Carrot, okra, onion, pepper, spinach, 80–85. Eggplant and salsify, 75–80. Parsley and parsnip, 70–75. Celery, 60–65.

Seeds may be too old to germinate. Lettuce seeds can be kept for four years and still germinate while onion seeds can not be kept more than one year.

The seed crop may have grown under unfavorable conditions.

The seeds may not have been properly cured.

They may not have been properly stored.

Infected seeds should not be planted—for example, pea seeds infected with weevils, and bean seeds infected with anthracnose.

After the seeds are tested, do not throw them away, but allow the plants to continue growing by removing the top plate and cover of cloth and keeping the plants well watered. They will grow for several weeks from the material stored in the plant.

Seeds should be produced from carefully selected seed plants that should be given special attention and provided with all conditions favorable for a continuous healthy growth. These plants should be grown far away from other varieties of inferior qualities to insure against cross pollination.

Through the State Agricultural Experiment Station, the names of the leading seed firms of the State may be secured.

THIRD PROJECT: WHAT WILL BE THE COST OF THE VEGETABLE SEEDS NEEDED TO PLANT A GARDEN 20 BY 20 FEET IF INTENSIVE GARDENING IS TO BE PRACTICED FOR 12 MONTHS?

The answer depends upon a knowledge of the following: What vegetables are to be planted? How many rows of each will be needed to supply the family? How many plantings are to be made? How much seed is needed for 20 feet of drill? A plan should be drawn for each season's planting.

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