

Program 4 - SEEDS: MYSTERIOUS PELLETS - October 14, 1940SOMETHING TO DO AND TALK ABOUT FIRST

If there is anything that might explain to us the mystery beyond this life, it should be seeds. Weed seeds have been placed in glass bottles, buried in the earth, dug up and planted. And still they grew. Lotus seed four-hundred-years-old grew when planted. Seeds have been placed in a vacuum for a year, frozen for three weeks; and still they grew. Surely, when you buy a packet of seeds, you buy a dime's worth of mystery which the wisest cannot understand.

Children often cut a bean or pea seed in half to find the little plant inside, all wrapped up with nourishment for its future growth - the plant of tomorrow. The children may enjoy repeating this adventure, with the idea of arriving at a definition of a seed. A seed is a tiny plant encased in a sturdy skin for its protection, with a supply of food to give it its start in life when it finds a favorable place and time. This same food, which Nature intended for the plant, man appropriates for his own use.

Discuss the importance of seeds to the farmer. Seeds carry the crop from one growing season to the next. Ask pupils to find out how much wheat, rye, or oat seed is usually planted to the acre, and what the harvest may be in bushels. How many times does a seed multiply itself?

DO YOU KNOW THESE WORDS?

pollen	pollination	vacuum	propagate
budding	cuttings	appropriate	grafting

LISTEN FOR THESE IDEAS

1. Why is the good farmer careful to select good seed?
2. Some plants have no seed. What are some of their names? How are they propagated?
3. Give three other methods of growing plants, other than planting seeds. (Cuttings, grafting, budding)

SOMETHING TO DO AND TALK ABOUT LATER

1. Ask pupils to bring seeds of important farm crops to class. Hold a seed identification contest with these collections.
2. Make a collection of the fruits or seeds of as many plants as possible. Illustrate with them the many ways Nature has provided for scattering seeds.
3. Seeds are produced very abundantly. Do all of them grow into plants? Why not?

Wisconsin School of the Air,
Afield with Ranger Mac
October 14, 1940

SEEDS, MYSTERIOUS PELLETS

Hello Boys and Girls:

"O suns and skies and clouds of June,
And flowers of June together,
Ye cannot rival for one hour
October's bright blue weather."

The Indians called October the 'Falling Leaf Month.' It is clear to all of us just why they did so. Last week I hiked through a beautiful stretch of hardwood timber - maple, basswood, yellow birch with a scattering of white pine and hemlock. With each gust of wind the yellow leaves would fall, and it seemed like a fairy land. A woodchuck scampered to his burrow. He was roly-poly fat with food stored in the tissues of his body, food to keep in the fires of life while he takes his long winter's nap. The short round wings of a grouse whirred noisily, while the wing beats of the robins made little sound. The robin will travel mile upon mile to the south, while the grouse will not go far, just far enough to find buds and berries with which to keep the fires of life aglow while it braves the cold and snows of winter. And here we find the three ways by which nature's creatures spend the winter. Johnny Chuck crawls into his burrow, curls up, and falls into a stupor called hibernation; the birds travel south, or most of them do; and some creatures brave the rigors of winter, getting such food as they can find to provide the necessary heat and energy. You and I are among those creatures that must brave the rigors of winter, but we have learned to be like the squirrel to store seeds in bin, fodder in silo, fruits and vegetables in cans, to provide warm shelters, and to don heavier clothing, and so long as we have a good harvest of seeds and fodder, we have little to fear. And that brings us to our subject for today - seeds. I remember how I used to enjoy digging my arms deep into a bin of grain. Seeds by the millions; food for the horses and cattle. That's the way I thought about it then. What for flour; oats for oatmeal; corn for Johnny cake and many other articles of diet. Man has taken the food stored up in the seed and uses it

in hundreds of ways for his own food. But in Nature the seed has its own purpose, In Nature the seed is a means of continuing and increasing plant life from year to year and from place to place. That dry little hard pellet has stored in it the germ of life and food enough to start another plant well on its way until the plant can depend on getting its own food from the soil and the air. A mysterious little thing is the seed; a kind of a miracle that even the wisest can't quite understand. Their importance is so great that it would be impossible to get along without them. Without seed there would be no farmers. Of course, there are some things that can be grown without seeds like potatoes, yams, onions, strawberries, and raspberries, but how impossible it would be to grow corn, wheat, oats, barley, cabbage, tomatoes and all the rest from cuttings, slips, grafts and layering. Because of the importance of seed to man in supplying food, man has learned how to grow large seeds and more of them than plants produce in their wild state.

Now that we have learned about the importance of seeds, let's find out what a seed is and let's tell the story of how the seed is formed. If you take a peep into a seed like a bean or a pea, you will find that the plant is actually there with a lunch all packed around it. So a seed is a tiny plant that has stopped growing; sleeping - that is what it is doing; and it is kept in this sleeping state by a hard protective covering. Sometimes this protective covering is so hard and stony that it takes two or three years for the weather to soften it enough for the germ within to start growing. The seed of the black locust is like that, so before we plant black locust seed, we pour boiling water over the seed to break this covering. Then the plants will start growing immediately. So, cramped into this small space, is the tiny plant together with enough food to give it a start in life, enough food until it can manufacture its own from the soil and the air. That is something like the newly-born pike minnows which have a little sack of food at their throats, or like the newly hatched chick with the yolk in its body - these furnish food until they are strong enough to help themselves. And so within that hard covering is stored starch and sugar and sometimes oil - all packed away by the kind wisdom of mother nature for the early helpless days of the plant. It is this

food that the squirrel gathers when he jumps in the coloring leaves of autumn. It is this food that man gathers when he threshes in the hot days of August. But that tough protective covering is very necessary. Without it this food would dissolve and the germ of life be killed. This hard covering packs the food away and puts the germ of life to sleep, and so it rests over winter until the warm rains and warm sun of spring weaken the coat, oxygen and moisture reach the little germ of life and it starts to grow. Then out from the sharp end of the seed two shoots appear. One seeks the dark of the earth, the other seeks the light of the day - down and up, earth and air. How it does it, only the Creator knows. And so it continues to grow, until the food supply is used up, the hard seed coating is parted from the new plant and the new plant sets forth to seek its fortune.

If you think this is mysterious, let's go back and see what took place when this seed was formed, and where this spark of life came from.

The other day I noticed a bee working away on the flower of a New England Aster. I suppose that the strangest thing that some plants do is to hang out bright flags - red, and white and yellow and many other colors - to attract the insects attention. Now the bee I saw may have been flying along enjoying October's bright blue weather, when he spied the purple banner of this aster, and he said to himself: "I didn't know that Miss Aster was still alive, but I see her waving her flag, so I'll go over and visit her." So he did; I know because I saw him there. And that lovely flower had a dish of honey and pollen waiting for him. So he fills his pollen basket and then makes a bee-line for the hive, for pollen and honey are necessary foods for the hive. Without honey made of nectar and bee-bread made of pollen, the bees could not live and raise their young.

But if you think that the bee was the only one served, you are mistaken. For that bee may be carrying just what the flower needs in order to do just what it was created to do - and that is to have seeds. That bee may be carrying just the right kind of pollen grain that the flower needs, and if so, that flower will be able to develop its seeds. Sometime when you study botany in high school, you will learn just what takes place when a pollen grain of the right kind falls on a pistil. You will learn that the pollen grain

has life, that it sprouts and grows and finally unites with the undeveloped seeds in the chamber at the base of the pistil, and forms seeds that will grow. And so, you can see that bees are as necessary to some flowers as the flowers are to the bees. And you will be interested to learn that many bees will take the nectar from certain kinds of flowers only. That little flower that blossoms in the spring called the spring beauty has only one kind of bee that visits it; there is a bee that visits only the water lily, there is a pickerel-weed bee, and the bumble bee that visits the red clover. Years ago when the fig was first introduced into California it would not bear fruit until they brought over a certain kind of fly that knew how to carry pollen from one fig flower to another; in other words, to pollinate the flower of the fig. So the fig crop, like our apple crop, and many of the crops that furnish us food depend upon bees or some other kind of insects. This carrying of pollen from one plant to the pistil on another is called pollination. But, I can hear you say, there are some flowers that do not set their banners to attract insects; some flowers that are green, unattractive, and have no fragrance. That's true. Corn is one of them, so is wheat, rye, barley, oats; some of the weeds - such as ragweed; some of the trees as the oaks, beeches, poplars, elms, birches, walnuts and hickories. The pollen of these plants is carried by wind instead of by bees, and nature, knowing that much pollen will be wasted, produces an abundance of pollen.

Golden rod hangs out a bright yellow flag to attract the insects, and so this flower is pollinated by bees and other insects. So you would not expect much of its pollen to get into the air. So the golden rod is not the cause of hay fever. But the ragweed is wind pollinated, and the plant produces an abundance of pollen, and now it is quite definitely known that much of the hayfever is caused by these wind carried pollen grains of the ragweed that are breathed into the nostrils. In producing hybrid seed corn the farmer has learned how to control pollination and in this way to grow seed that will produce larger plants and larger ears.

Farmers have come to learn that the success of their crops depends much upon securing plump, well filled, healthy looking seed. The seeds of ordinary farm crops, except corn, are likely to be mixed with seeds of weeds and other plants, dead seeds and imperfect seed. The smaller the seed, the more likely it is to contain some or all of these

impurities. And so cheap seed is likely to be the most expensive in the end because the presence of these impurities will surely reduce the yield.

Did you ever make a collection of seeds? The other night Ranger Mac visited a school that made a collection by boring holes in a thick piece of card board, placing the seed in the holes and pasting over each hole a piece of cellophane. Another way to make a collection is by placing the seeds in vials or small bottles and then labelling the bottles. These exhibits make interesting additions to the school museum, and they can be used for contests in identification.

Before we come to the end of the trail for today, let us mention a few of the crafty ways that seeds make their way into the world. These are about as clever as the development of the seed is beyond understanding. Once Darwin, a great scientist, grew a whole weed garden from the feet of migratory birds. Some plants throw their seeds like the witch hazel, violet, and black locust; some are carried by wind like the winged seeds of the cattail that now encircles the earth; some float in water like maple and coconut; some attach to men and animals; some are carried in the digestive organs of birds.

And so the seed, which nature prepares so carefully, is provided with some clever way of getting out into places where it can grow. I wish I knew how to peep deeply into the secrets of the seed. Then, I am sure, I should know more about the unsolved things that surround my own life.

Good Luck!

And May the Great Spirit
Put Sunshine into your Life
Today and forevermore,
Heap Much!