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Everything
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Fruits by the crate or in smaller quantities. Just right for canning. :: ::

J. N. PEALE

Broken Bow, -:- -:- Nebraska.

Home Course In Modern Agriculture

I.—How a Seed Starts to Grow

By C. V. GREGORY,
Agricultural Division, Iowa State College
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A SEED is a simple thing to look at. It might as well be a pebble or a grain of sand for all there seems to be to it. Only a bean, you say, yet there's a great deal more to that bean than you ever dreamed of.

Take a bean—just an ordinary white bean out of the pantry—and look at it. The smooth white outer covering is the seed coat. It is almost water tight and is a protection for the parts that lie within. On one side you will notice a very conspicuous spot. This is the seed scar and is the place where the little stem that fastened the bean to the pod was attached. Near one end of the seed scar, or hilum, as the botanists call it, is a small round hole, the micropyle. If you put a bean in water it will soon begin to swell because of the water which it absorbs through the micropyle.

Now, take a bean that has been soaked for a few hours. The seed coat will come off easily. The part of the bean that is inside is found to be split in two lengthwise. These two halves are called cotyledons, which is only another name for seed leaves. Spread the cotyledons apart carefully. If you look closely you can see a little plant tucked snugly away between them. Just to one side of the middle is a small stem, the caulicle. Fastened to it is the plumule, a tiny bunch of leaves so small that you may have difficulty in making them out. Farther on, at the end of the bean, is the stubby root, or radicle. These different parts are found in every seed, no matter how small.

Now that you have seen what is in the bean, examine a pumpkin seed in the same way. It is much the same inside as the bean, only flatter. The hilum is at the pointed end, and the plumule is so small that you may not be able to see it at all. In these two seeds there are only two main parts, the seed coat and the little plant. By far the greater part of the room inside the seed coat is taken up by the fleshy seed leaves.

Now let us look at a different kind of a seed. Take a kernel of corn that has been soaked for several hours and cut it in two lengthwise the narrow way. The back of the grain is made up in part of a hard, flinty substance and in part of a white, mealy layer. A large part of the front of the kernel is taken up by the soft, oily germ.

Look at the cut section of the germ carefully. The little plant can be made out very plainly. The little pointed stem which points upward and outward is the cotyledon. There is only one cotyledon in corn instead of two, as in the other seeds you have examined. If you will take a cotyledon of a corn plant that has been left in a warm place until it has commenced to grow and cut it in two lengthwise you will see that the inside is packed with layers of tiny leaves ready to unfold as soon as their turn comes. This is the plumule. The other parts of the little corn plant you will be able to make out with little trouble.

You have doubtless been wondering what the rest of the kernel, the part back of the germ, is for. While it is not a part of the plant itself, it is of very great use to it, as we shall see. The little plant when it begins to grow must have food. At first it has no roots to get this food from the soil, so it must get its nourishment from some other source. This source is the part of the kernel outside of the germ itself, or the endosperm. In the pumpkin seed and the bean the endosperm and the cotyledons are the same—that is, the food material is stored in the large, fleshy seed leaves.

This food material consists largely of starch and oil. Neither of these can be used by the developing plant without first being changed to a soluble form. This is one of the reasons why seeds will not germinate without water. The other reason is that the water is needed to soften the seed coat so the plant can get out. But this starch and oil will not dissolve in water without first being changed to a soluble form. This is accomplished by means of ferments called enzymes. If you will put a piece of starch on your tongue for a moment you will find that it will begin to taste sweet. This is because the ferments in the saliva are changing it to sugar. The enzymes in the endosperm work in much the same way, changing the starch and oil to sugar and other soluble substances. These are dissolved by the water and go to feed the growing plant.

These enzymes cannot work without air and warmth. You already know that a seed will not germinate in cold ground, and if you will put some beans in a glass of water and leave

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Two rooms for rent in the Meyers block. E. F. MEYERS.
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FOR SALE.—Four room house with 1-6 block of ground. Close in. H. Simonson 22-tf
The winter term at Custer College will begin January 4t. 27tf.
WANTED.—A man and wife to work on a ranch for the winter. Inquire at this office. 28 tf
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Drink "Blue Ribbon" coffee. Roasted fresh every day. 24tf.
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"Thorough to grass"—Parties having stock to put out winter or summer can find good accommodation for same by writing. 32-2f C. H. CASS, Loyal, Neb.
Drink "Blue Ribbon" coffee. Roasted fresh every day. 24-tf.
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Two office rooms to rent in the Meyers building. E. F. Meyers.
I have now arranged to take care of a general collection business, having secured a competent clerk and stenographer, and all collections will receive prompt and energetic attention. 20-tf N. T. GADD

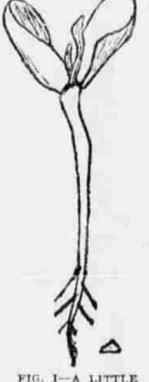


FIG. I.—A LITTLE BEAN PLANT.

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BROKEN BOW ABSTRACT CO. BONDED
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As good as money can buy or skill produce.
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1st and Sweepstakes at Nebraska State Fair 1907.
WHITEHALL, KING 48003.
Of well high faultless conformation and breeding.

7 SOWS AVERAGED 12 PIGS, SPRING '08. 7

Sows Sired By: King Look 24459, Grand Look 38305, Chief Tec. 3rd. 20740,
Young Tec. 42406., Standard Chief 2nd etc.
Stock for Sale at Private Treaty No Public Sale This Fall.

M. E. Vandenberg, - - - Sargent, Nebraska.

Schedule of Broken Bow Mails.

FOUCHES FOR THE EAST CLOSE AS FOLLOWS:

Train No 40.....	6 a m
Train No 42.....	9:30 a m
Train No 44.....	7:30 p m

FOUCHES FOR THE WEST CLOSE AS FOLLOWS:

Train No 43.....	8:00 a m
Train No 41.....	7:30 p m

Office open Sunday from 9:30 to 10:30 a. m. week days, 6:30 a. m. to 7:30 p. m.

B. & M. Train Schedule

WEST BOUND		EAST BOUND	
No. 39.....	6:20 a m	No. 40.....	6:40 a m
No. 41.....	11:27 p m	No. 42.....	9:50 a m
No. 43.....	8:22 a m	No. 44.....	11:27 p m

Nos 39 and 40 run between Lincoln and Broken Bow only, and not on Sundays
Freight trains Nos 47 and 48 carry passengers but are run as extras

The Misses Lottie Bowman and Ellen Cane of Anselmo were visiting in Broken Bow the first of the week.

TEDDY ON THE HUNTING TRIP

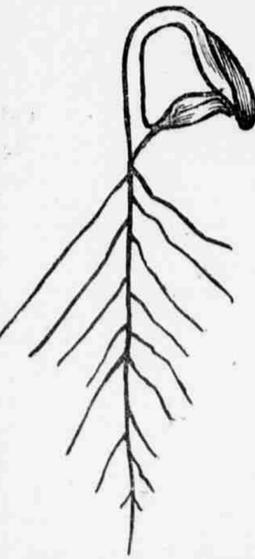



FIG. II.—HOW A SQUASH PLANT TAKES OFF ITS SEED COAT.

We can help the soil to become warm in the spring, then, by doing all that we can to check evaporation. Did you ever notice how quickly the surface of a wet field became dry after it had been harrowed? This is because stirring and loosening the soil stops the water from coming up from below. The water in the loose upper layer soon evaporates, and after that the heat is used in warming the soil instead of turning the water into vapor. Of course if we are not going to allow the surplus water to be given off by evaporation we must provide the drains and ditches to carry it away. We shall study more about drainage and the movement of water through the soil in another article.

Winter Excursions Low Rates

Winter Tourist Rates:—Daily reduced rate excursions to California, Old Mexico, Southern and Cuban Resorts.

Homeseekers Excursions:—First and third Tuesdays of each month to many points west, south and southwest.

Personally Conducted Excursion to Florida by Superintendent Public Instruction of Nebraska, Mr. J. L. McBrien, leaving Lincoln and Omaha December 19th. Write G. W. Bonnell, C. P. A., Lincoln, for intinerary.

Government Irrigated Homesteads in the Big Horn Basin and Yellowstone Valley:—One of the last chances to secure good farms from the Government at low prices. Go with Mr. D. Clem Deaver on the next personally conducted excursion. He will help you secure one of these farms. No charge for his services. Excursions first and third Tuesdays.

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