Notice for Bids for Burial of Paupers

Notice is hereby given that by order of the Board of County Commissioners of Box Butte county sealed bids will be received at this office until February 23, 1909, for digging graves and proper burial of any county paupers, said contract to continue in force for term of one year, beginning March 1st, 1909 and ending March 1st, 1910. The board reserves the right to reject any and all bids for good and sufficient reasons.

W. C. Mounts, County Clerk.

Bids for County Poor Farm and Care of County Poor

Notice is hereby given that by order of the Board of County Commissioners of Box Butte county sealed bids will be received at this office until February 23, 1909, such to specify rent that will be paid for county poor farm, price per week charged for board of county poor, same to include lodging, washing and care of county paupers for the term of one year, beginning March 1, 1909. The board reserves the right to reject any and all bids for good and sufficient reasons.

W. C. Mounts, County Clerk.

Trees for Sale

Cottonwood trees from 18 inches to 7 feet high for sale in lots from 10 up; also some good ash. Write me what you want. I refer you to R. M. Hampton, who bought 500 of me last spring.

A. M. Templin,
6-4w Palmer, Nebr.

House and two lots with barn 28x32, and new windmill, to trade for horses or cattle. Inquire of E. Becker, at Alliance Bowling Alley. 5-tf.

A piano for rent cheap to a family without children. Inquire 804 Box Butte avenue or phone 310. 5-w

FACTS

¶ The news items of the home community.

¶ The things in which you are most interested.

¶ The births, weddings, deaths of the people you know.

¶ The social affairs of our own and surrounding towns.

These are the kind of facts this paper gives you in every issue. They are certainly worth the subscription price.

Home Course In Modern Agriculture

I.—How a Seed Starts to Grow

By C. V. GREGORY,
Agricultural Division, Iowa State College

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.

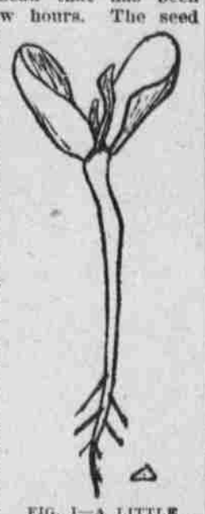

FIG. I—A LITTLE BEAN PLANT.

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, fishy 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 liquid 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 them for several days you will find that they will not germinate, no matter how warm they are kept, because they cannot get air. The reason is that without both air and warmth the enzymes cannot prepare the food for the plant, and if it cannot get food of course it cannot grow.

After the plant has started to grow the seed coat is no longer of any use to it. In some plants, such as corn, the little plant finds its way out very easily. The little pumpkin plant, with its heavy coat, has a harder time. Indeed, were it not for a little contrivance with which nature has provided it it could not get out at all. This is a tiny hook on the lower end of the seed. This hook catches on the end of the seed coat and peels it back as neatly as you take off your coat. Watch for this in a germinating pumpkin or squash seed and see if you cannot notice it. In some seeds, like hickory nuts, the plant is unable to get out until the seed coat is cracked by the frost or in some other way.

We have seen that a seed cannot start to grow unless it has moisture, warmth and air. It not only needs these, but it needs them in the proper proportions. In a light, sandy soil moisture is often lacking, and the seed is slow in germinating for this reason. In such a soil growth will start more quickly if the soil is packed tightly around the seed. The seed will soak up moisture more rapidly if the particles of soil are in close contact with it on all sides. Packing down the soil in the row with the flat side of a hoe or with a board or with the broad, flat planter wheels in the field helps the seed to absorb moisture and so hastens germination.

In a heavy, sticky clay soil there is usually plenty of moisture, but air is often lacking. If such a soil is packed down too tightly over the seed the particles are forced so closely together that very little air can get through, and hence germination is delayed. In a soil of this kind seeds should never be planted very deeply.

The most important factor of all is warmth. A cold soil may have moisture and air in exactly the right amounts, and still the seed will not start to develop. Even if it does begin to grow progress will be slow, and the plant will have a weak, unhealthy look. It is of the utmost importance to wait until the seed bed is warm before planting the seed. Many seeds which would rot or produce only spindling stalks if planted in a cold soil will grow into strong plants if planting is delayed until the soil has become warm. Any seed will make a stronger, better producing plant if it has a warm seed bed to start from.

The rapidity with which soil will warm up in the spring depends a great deal upon the nature of the soil itself. A sandy soil warms up quickly because the air can get down into it easily, thus warming it all the way through at once. Another reason for the higher temperature of sandy soil is its greater dryness. As long as water is evaporating rapidly the ground will be cold. The process of evaporation requires a great deal of heat.

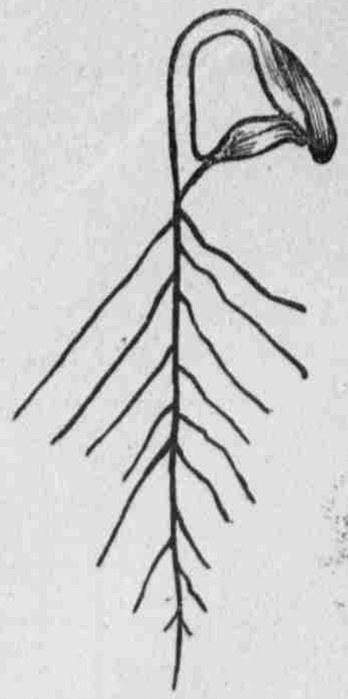

FIG. II—HOW A SQUASH PLANT TAKES OFF ITS SEED COAT.

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 tile drains and ditches to carry it away. We shall study more about drainage and the movement of water through the soil in another article.