

# SOILS AND WOODS

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## NITRO-CULTURES AND THE INOCULATION OF LEGUME SEED.

Although occurring to the extent of about 80 per cent. in the air, nitrogen is considered the most expensive of the elements of plant food. This is due to the fact that with the exception of members of the legume family, plants are unable to utilize this atmospheric nitrogen, but must depend upon the supply of that element in the soil. Leguminous plants, however—alfalfa, clovers, vetches, peas, beans, etc.—are enabled to use the nitrogen of the air through the action of bacteria which exist in the characteristic nodules found on the root system of well developed plants of this group.

These useful bacteria, if present in the soil, enter the root of the young plant, multiply and develop the swellings or nodules, assimilating nitrogen from the air and passing it on to the plant. The plants developed in this manner are stimulated, the nitrogen supply of the soil is conserved or even increased, and benefit is thus felt by a succeeding crop.

For each kind of legume a special variety of bacteria is required whose presence in the soil is necessary. If a particular crop has been growing successfully in a short rotation it may be assumed that nodule bacteria of the right kind are in the soil. Many soils, especially in the newer districts, are deficient in these bacteria, and in most cases where a legume is being grown for the first time, or after a long lapse of years, it will be of advantage to add bacteria, or in other words, to inoculate.

Inoculation may be effected by taking soil from a field where the same

crop has grown successfully and incorporating it with the new land at the rate of 200 lbs. or more per acre. This practice is often expensive and is always subject to the danger of introducing weeds, insects and plant diseases.

Another method, much simpler to apply, is that of adding a pure culture of the nodule bacteria directly to the legume seed before sowing. This method has been tried for a number of years, and in cases where a scarcity of bacteria of the proper sort is suspected will give, in a large number of cases, beneficial results.

The Dominion Experimental Farms wish to encourage the use of nitro-cultures among the farmers of Canada, and the Division of Bacteriology will supply free to any farmer who applies directly, sufficient nitro-culture to inoculate 60 lbs. of seed for any legume he wishes to try out. In making application it is necessary to state the kind of seed used and give, if possible, the approximate date of seeding in order that cultures are sent out only with the understanding that the applicant agrees to report the result of his inoculation trial, whether it be successful or not. Many phases of the question of inoculation are not understood, and it is only by accumulating information as to the results of such trials by farmers themselves that many problems not yet solved will be cleared up.

Application for culture should be made to the Division of Bacteriology, Central Experimental Farm, Ottawa. Cultures are not sold, and the quantity supplied to any individual is limited to the amount specified above.

—A. G. Lochhead, Dominion Agricultural Bacteriologist.

## PROPAGATING ROSE PLANTS

Rose culture is a fascinating subject. Some varieties of roses root readily from cuttings and make very good plants, but as a rule garden roses are stock roses budded on to a brier. That is to say, the root is a brier and the upper portion is of the same variety from which the bud was taken. Climbers are perhaps more easily rooted. If one will fasten to the ground at different points, a young rose vine, it is likely to take root at each of the spots where it is in contact with the soil. The branch, after having become well rooted at the different points, can be severed between the rooted portions, each making a new plant. These of course will all be of the variety of the parent climber.

Roses are budded on to briers or other wild stock because these are more vigorous, that is to say, they withstand adverse climatic conditions better than some of the finer varieties of roses, particularly the hybrid teas. Budding is done usually in the month of August. A T-shaped cut is made by the operator in the main stem of a growing brier. The cut is made as close to the root as possible, usually just above the surface of the soil. The bud, which has previously been taken from a rose branch, is so trimmed as to fit in beneath the bark where the T cut was made. The bark is then wrapped tightly over the bud with raffia. The budding is best done on the south side of the brier so as to get full benefit of the sunlight.

The bud, if all goes well, makes a perfect union with the brier, although no growth is shown that season. The following spring the bud shoots out and grows rapidly. After a few weeks of growth, when the brier is seen to be making progress, the brier branches are cut away. This throws all of the sap of the brier root into the new rose plant. It is well when cutting off the brier shoots, to cover the wound with paint. This keeps out moisture and saves the wood from weather injury.

The operation of budding calls for skill and experience. The buds are taken from cuttings of the present year's growth. One cutting will yield three or even four buds. The buds are found in the axils of the leaves, that is to say, everywhere a leaf is growing or one has fallen off, there exists a bud. Each bud is sliced off to be inserted in the cut in the brier stem. Successful budders get ninety per cent of the buds to take.

When making standard tree roses the budding is done not at the foot of the brier, but from three to four feet up the stem of the brier. As a rule two or even three buds are inserted on one brier stem, spaced an inch or two apart and on different sides. Roses are shipped out from the nursery as commercial bushes in their second year. It is not uncommon for the brier to throw up a branch from below the bud. If this is allowed to grow it will soon be receiving all the nourishment and the rose will succumb. For this reason experienced raisers watch for the brier shoots and cut them off as soon as they appear.—Can. Hort. Council.

## POULTRY.

Milk is of unquestionable value in poultry feeding.

When fed for its nutritive value primarily the dry products, such as dried buttermilk or dry skim milk, probably are the most economical and efficient.

There are, however, other properties—palatability, and the tonic factor which liquid milk possesses. When fed for this purpose, sour skim milk or sour buttermilk as either comes from the dairy or the churn is ideal. In the absence of this product, a semi-solid buttermilk, diluted and fed as a beverage or slightly diluted and mixed with the moist mash, is highly desirable.

The lactic-acid content acts as an internal disinfectant, cleansing the digestive tract, and the ration with which it is fed will be more quickly consumed and more efficiently digested.

Milk can be fed to the poultry flock without any material increase in cost, because where it is fed for protein content meat scrap can be reduced. With the discovery of vitamins, cod liver oil has come into considerable prominence because it is rich in vitamin D.

A deficiency in this vitamin brings about leg weakness in young chicks. This is especially prominent in early hatched chicks which cannot get the natural green feed; also when they do not get the benefits of direct sunlight.

We can prevent this condition by supplying early hatched chicks with cod liver oil. From 2 to 3 per cent. of it added to the ration of brooder chicks will guard against leg weakness.

Cod liver oils differ greatly in quality, however, and their keeping quality is dependent upon how they are held. Feed mixed with the oil should be consumed immediately. The practice is to mix the oil with the dry mash, working by hand the quantity to be given into a small quantity of mash, and then later mixing this thoroughly with the entire mixture.

The extent to which one uses the things mentioned will depend largely upon the cost balanced against the benefits which one will receive. The Epsom salts barrel has become a regular part of the feed-room equipment. Its use is made necessary by the fact that during the winter season, when birds are confined, they cannot secure the abundance of green feed which is highly laxative and keeps them in condition. During this period they are fed quantities of concentrated protein feeds. Laying flocks are very apt to become constipated, and a condition of auto-intoxication develop. This does not kill the birds, but it slows up production and lowers the resistance of the entire flock to disease. So the feeding regularly every two weeks of Epsom salts to each 100 birds is very desirable for the average poultryman.

## DAIRY.

My experience in dairying teaches me that it is a big paying investment to give the growing heifers good care. As a rule, when the young heifers in the fall are rather low in flesh on account of the scant pasture that always precedes the coming on of winter.

In growing young stock to replenish the dairy herd the aim should be to keep them growing constantly. The setback in growth during early development is not only costly, but difficult to regain, and ultimately affects the usefulness of the animal. Often stunting is permanent, and regardless of good feeding the latter cannot be altogether overcome.

I find it a good plan to keep my young heifers separate from the rest of the herd during the winter. Young stock of any kind is timid and fearful and especially when running with the older stock. Growing heifers should have plenty of yardage space. They should be stabled at night and fed in such a way that each animal receives its full share of the feed.

As a rule, roughage is not sufficient to meet the full requirements of growing heifers. I believe, however, that the grain ration can be materially reduced by feeding plenty of such roughages as corn silage, clover, or alfalfa hay.—L. C. R.

## SHEEP.

Ewes should produce a large uniform flow of rich milk. To prepare ewes to do their best work during the nursing period, they should be put in good condition before the lambs arrive.

Ewes cannot be expected to do their work satisfactorily and return the greatest profit if allowed to become run down in flesh and physical strength. Growing the lamb crop before it arrives places a heavy claim upon the health and vitality of the ewes. If the ewes lack in condition the lambs are sure to suffer. To develop the milk flow in ewes, the feeding must be liberal.

It has been my observation in handling breeding ewes that milk production depends as much upon proper feeding before the lambs arrive as after. The milk producing system must be developed along with the growth of the unborn lamb crop. To achieve the desired end it is important to feed pregnant ewes a nutritious and appetizing ration of roughages and grain.

## Sunshine Encourages Rickets.

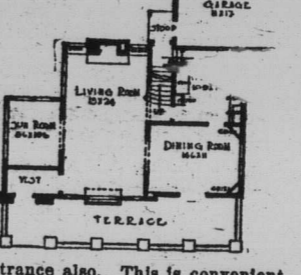
Scientists are now pointing out the value of plenty of sunlight in the growing of strong, vigorous, healthy bodies. Tropical men, accustomed to much sunlight, have strong bones and good teeth. Remove these men to temperate climates where the percentage of sunlight is reduced by their changed habits of living, and they rapidly develop rickets and poor teeth.

According to recent investigations,

## AN EXCEEDINGLY ATTRACTIVE ENGLISH TYPE OF HOME, WITH ATTACHED GARAGE



The home illustrated this week is one recently planned and is now being built in one of the Country Club Districts in the outskirts of a large Western city. The design, somewhat English, is frame construction using white cement plaster trowled smooth for the outside walls, with stained shingles on the roof. The soldier course of brick is carried around the base and a wide open terrace with cement piers and iron rail give an inviting appearance.



The entrance is through a vestibule, direct into the large living room across the end, the fireplace being placed in this portion. The ceiling over this portion has been furred down to provide for the return of the stairs, thus giving a neat appearance to this end of the room. The dining room is most attractive with built-in corner cupboards and French doors leading out on the terrace. The kitchen is complete with ample cupboards, place for ice-box and sink and electric range. The grade entrance is used as a rear

entrance also. This is convenient to the garage. The roof extends down over this small stoop and serves as a protection from the weather.

On the second floor, there are four good bedrooms, each with cross ventilation and good wall space, together with ample closet room. The large owner's chamber in front is provided with three closets. The basement is complete with laundry, storage and boiler

THIS ARTICLE REMOVED

## Home E

"The Child's First School"

## Should We Contradict Each Other?

A long time ago there was a little girl who was bright, eager and full of life. She was impulsive, interested in everything she saw, and brimming over with ideas. But so many times her eyes clouded, her interest dulled, because when she tried to show older people that she saw things differently, or meant something that they did not understand, they said to her sharply, "Don't you contradict me. I am older than you and you should not contradict your elders."

The little girl had not meant to contradict, she had been trying to get out some of the many thoughts which tumbled over each other, and which grown folks seemed so slow to understand. Yet when these people told her things—and she was always so glad to have them talk with her—if often flatly disagreed with her. "But you contradicted me, Mama," she said with a puzzled appeal in her eyes one day.

"That is different," said the mother. "I am older than you." The little girl learned to keep silent even when she knew people were hearing things wrong, and she learned quite fast on concerning her, but she wondered and wondered. And after all, woodlot forestry is simply assisting nature in what she is trying to do for herself.

## THE CHILDREN'S HOUR

ABOUT BIG WORDS.

Wallie Wattle's father uses big words; and Wallie, who likes their sound, tries to remember them, and usually succeeds. Wallie really doesn't do this to show off. First, as we said, he likes the sound of these words; and then there's another reason. Alec Esterville, whom the boys call Smart Alec, thinks he knows more than anyone else because someone gave him a big dictionary for his birthday.

Every time Alec starts to show off by using a big word Wallie annoys him by using a bigger one that he has heard his father use. The other day Alec read in a newspaper that wheat had been in use for ages and ages. At once he got out his dictionary and looked for a fancy way of saying this. Well, he found one, and the next day he approached a group of boys in front of the school and said: "Do you kids know that wheat is quite an antiquated product; in fact, very antediluvian?"

Then, though no one asked him for an explanation—for the boys were more interested in talking about the school baseball team—Alec started to explain: "Antediluvian means before the flood—the one that Noah figured in." Allen Withers, who likes to annoy Alec, yelled: "Huh! Listen to that! He says wheat came before the flood. It must have come after it, 'cause wouldn't the flood have washed it away?"

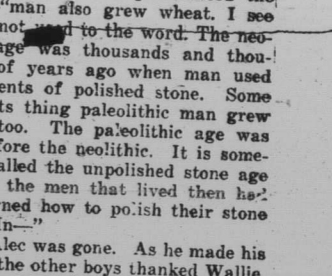
With this everyone laughed at Alec, who protested: "Huh! Listen to that! He says wheat came before the flood. It must have come after it, 'cause wouldn't the flood have washed it away?"

...didn't make sense in mind, it didn't seem way there was no use 'e about it because one trouble. However, she resolution. She resolved that w. she grew up and married and had children, she would never contradict them. She would not contradict them even though it were perfectly all right for her to do so. The years passed and the little girl married and had rosy, sturdy children. When they began to grow to the eager, questioning, experimenting age, the grown up little girl never once forgot her early resolution. If she differed in opinion with her little children she would say, "Perhaps you are right, but I thought it was this way," or, "Now are you sure that is not because I had a different idea about it," or, sweetly and politely, "Excuse me, dear, but I think you are wrong." It was no wonder that the children were so obedient and happy in that house that people commented upon it.

Sometimes the child— "I know you don't mean to be rude, but wouldn't it be more polite and pleasant if you didn't answer quite so quickly? It sounded almost as if you contradicted me, but of course you and I know that isn't right as you don't do it to each other."

"What is antediluvian! It is, I say! I can prove it!" "It is, Alec," chimed in Wallie Wattle, who had been silent all this time. "You might also say that neolithic," he chuckled as he pronounced the word—"man also grew wheat. It see you're not up to the word. The neolithic age was thousands and thousands of years ago when man used implements of polished stone. Some scientists thing paleolithic man grew wheat too. The paleolithic age was just before the neolithic. It is sometimes called the unpolished stone age because the men that lived then had not learned how to polish their stone tools. In—"

But Alec was gone. As he made his retreat the other boys thanked Wallie.



A New Version.

Editor—"You can't get by with that joke. That's an old Pat and Mike wheeze." Jokesmith—"But don't you see how I've improved it? I've changed the names from Pat and Mike to Martin Luther and Oliver Cromwell."

The whaling industry in British Columbia produces annually about 400 tons of whale bone meal and 900 tons of meat and blood for fertilizing purposes. A small quantity of this is sold as fertilizer in the province and the remainder is exported, principally to the United States.