

# Lime and Crops

Address communications to Agronomist, 73 Adelaide St. West, Toronto

**When and How to Use Lime.**  
One most important office of lime is to keep the soil in a sanitary condition. Acids constantly tend to form in a soil, and lime is nature's natural agency to combine with these acids and destroy their toxic effect. Limestone is our chief source of material for use when there is a deficiency, and man learned in an early day to burn and slake it to put it into condition for distribution.

The lime in the stone is in a carbonate form, and the slaked lime goes back to that form when exposed to the air. Perfectly air-slaked lime is identical with the original limestone in composition. Within recent times we have learned to put limestone into form for easy distribution by grinding or pulverizing, and the material is just as effective for correcting acidity as air-slaked lime, pound for pound, if it is absolutely fine. Tests and experience upon thousands of farms prove that when the limestone has been made as fine as flour it is immediately available for combination with soil acids, and this is the chief work that we want lime to perform in the ground.

And there the argument starts, because there are degrees of fineness in limestone; there is the old contention that caustic lime destroys the humus; there is varying ease in distributing the kinds of lime upon the market, and there is the reasonable expectation that when fresh-burned lime has so much "pep" in its make-up, and limestone seems to have none, the former must be the more dependable.

It is acidity of the soil that is the handicap, and its correction is the one matter of interest.  
The slaking of stone lime on the farm is a disagreeable job, and usually is attended by some waste. In limestone sections where the stone was burned in large quantities and the lime was applied far too freely, it was a common practice to throw the stone lime into piles in the field and let it slake. Rains would cause some of this lime to puddle and get into unavailable form, and the distribution with a shovel was very uneven.

The ability of the lime to be distributed evenly and easily throughout the soil adds a great deal to its value per ton, and that is a consideration when choosing between lump lime and the hydrated. Manufacturers of the latter article have been able to push sales extensively because they furnished a lime easy to handle and to distribute, and many farmers have preferred to pay a large price for it rather than to slake the stone lime. There was the added inducement that the word "hydrated" had a scientific sound that might easily mean some sort of value added in a mysterious way. It is a good form, and in actual strength lies between lump lime and pulverized limestone.

There certainly has been unnecessary confusion in our thinking regarding the fineness to which limestone should be reduced. Experiment station tests are conclusive that when it is made as fine as flour there is almost no loss of value, but it doesn't follow that we should want all of the stone made that fine. The added expense to secure fineness is worse than wasted wherever an application is made to last through an ordinary crop rotation, because some of the soluble stone will leach out of the soil.

The experience of practical farmers has brought probably the great majority of users of limestone to believe that the expense of pulverizing the stone should be sufficient only to reduce all of it to a fineness permitting it to pass through a 10 to 20-mesh screen. We then have a very considerable proportion that is absolutely fine and immediately available, and this is in sufficient amount to meet the soil's need for the time if the application is made heavy

enough to provide coarser particles for use in later years of the rotation as disintegration occurs.  
It must be borne in mind that the lime requirement of a soil continuously increases, and if we apply only enough lime to correct the acidity at a given time, tests made six months later will show a presence of some free acid.

It would not be good business to meet the lime requirement of all land. There are regions whose soils are so acid that the only thing to do for the present is to depend as far as possible upon acid-resistant plants, such as red-top grass and some vegetables and grains that are less sensitive than the clovers. The cost of applications sufficient to correct all acidity would be too great for some areas remote from sources of lime.

On the other hand, most land lying within farms that are kept under a good crop rotation should not be left acid. The handicap upon production is too great. Lime in some form should be supplied, and by far the greatest part of these deficient soils can be made friendly to the clovers and fully responsive to fertilizers and tillage by the application of two tons of moderately fine limestone applied once in each crop rotation of four years or so.

Some land is too deficient in lime to grow red clover or to make maximum yields of most crops, and yet has a lime deficiency that may be met by a single ton of limestone applied in each crop rotation. Certainly, where clover has failed one does not go amiss in using a ton of burned lime or two tons of limestone prior to the seeding to clover and grass.

If the application is reasonably heavy, it is most profitable to make it after a sod has been broken for corn. The yield of corn will be greater because bacterial action in the soil will be promoted, and the tillage of the crop will mix the lime so thoroughly that the clover and grass seeded with the small-grain crop which follows the corn will have every chance.

If the application is not made sufficiently heavy to supply the wants of the soil soundly for a crop rotation the lime should be applied when the ground is being prepared for the small grain crop with which the grass and clover will be seeded, or when a seed bed is being made for grass and clover alone. The lime or limestone should always go on the ground after the plowing has been done, because the tendency of lime is to move downward.

Form-burned limes may be put in with the manure spreader or a line distributor that is provided with a sieve to remove refuse material. The hydrate and the limestone are easily applied through a lime distributor, and the best results are obtained when the ground is thoroughly disked after the distribution. We want a particle of lime in every cubic inch of soil.

A high-grade lime marl is a carbonate close in value to air-slaked lime, and air-slaked lime, we must remember, has practically the same value only as very finely pulverized limestone. Wood ashes formerly were an excellent source of lime, but have ceased to have any large commercial place. The ashes upon the market are apt to contain much dirt and moisture, and the lime often is largely in a carbonate form. Possibly ashes is average condition upon the market have a lime content whose value is not over one-third that of pulverized limestone or air-slaked lime.

The exceptions to absolute safety concern only (1) the man who might apply several tons of caustic lime per acre, adding no manure nor soda to supply humus, and (2) the owner of light sandy land, who should prefer a calcium to a magnesium lime if applied in a caustic state. These exceptions, as I have said, have importance to relatively few people.

If you are having soil trouble, it might pay you to look into the lime requirements of your farm.

## Hoops

Which is best for little pigs just weaned, sour or sweet skim-milk? Also for sows nursing pigs? What would make a good ration for weaned pigs? I have plenty of pasture, skim-milk, middlings and bran. I intend to use a self-feeder.—L. C.

### PREMIUMS!

### PREMIUMS!

### PREMIUMS!

List of Premiums for the

**TORONTO Fat Stock Show**

Now ready for distribution. Write To-day for Your Copy. Show will be held at

**Union Stock Yards, Toronto**

December 9th & 10th

C. F. TOPPING, Secretary  
Box 635 West Toronto

When pigs are old enough to wean from their mother I do not believe it makes much difference whether the milk is sweet or sour. But one thing I should be particular about, is to not feed sour milk one time and sweet milk the next. As it is difficult to keep the milk sweet in the summer time I would prefer to feed the milk sour, then the pigs always have the same kind of a ration. This will apply to the sows nursing pigs just as well as to the pigs. It does not destroy the food value of milk very much to have it sour. Of course, if you leave it until it commences to decompose then it is not as good.  
A splendid ration for young pigs right after they are weaned is skim-milk and wheat middlings. I do not believe you could get anything better and there isn't anything better to feed young pigs in a self-feeder than wheat middlings, unless it is animal tankage and, of course, at the present time this is very high-priced. I would feed them a very reasonable amount of middlings made into a thick soup with sour milk and then let them eat all the wheat middlings from the self-feeder they desire. Good pasture will reduce the feed bill.

Poor lubrication, overloads, and dust are the first place as the tractor's worst enemy.

## Financial Notes

Ottawa—From the trade statement just issued by the Department of Customs, it is evident that Canadians are buying tremendous amounts of goods still from the United States. During the four months ended July 31st last imports into Canada totalled the large sum of \$473,572,589 against \$284,897,013 in the same period last year. Exports from Canada underwent a decline of fifteen millions in the same period, this year's four months showing being \$342,112,423 against \$357,883,897 in first four months of last year's fiscal year. Total trade amounted to \$825,267,761 against \$653,787,357 in same four months a year ago.

Toronto—Present indications point to the fact that Canadian newspaper manufacturers at the beginning of 1921 will be quoting \$160 per ton for newsprint. When newsprint climbed to \$100 per ton many of the manufacturers at the time thought that the peak had been reached. Since that time, however, conditions have improved for the newsprint manufacturer to such an extent that many of them figure that \$160 is lower now than \$100 per ton was back a year ago.

Nelson, B.C.—Western Canadian mines are still exporting coal. A ship recently left British Columbia for Sweden with 4,500 tons of coal, and it is said that owing to the embargo on Atlantic ports, there will be further large shipments from the Pacific if bottoms can be secured.

The Canadian Collieries at Naraimo, B.C., which shipped this coal are in a position to export large quantities and, with the prices obtainable in Europe, will likely do so. At present, prices of coal in British Columbia are lower than anywhere in the world, it is claimed. Sweden has been buying coal from Australia at a price delivered of from \$45 to \$50 a ton, and English coal's even higher.

The general consensus of opinion in banking circles appears to be that tight money will obtain locally for some time to come. Owing to the high cost of labor and large wage increases it is taking a great deal more money than formerly to produce the same quantity of goods. This means that industrial plants require more working capital; and that the banks are called upon for funds to that much greater extent.

Another factor in the situation is the crop movement. As soon as the harvest is over tremendous shipments of grain will commence from the West to the East and the seaboard. The banks bear the chief burden of financing the crop movement from the time the grain leaves the farmers' hands until the price is remitted by the buyers. This takes a huge sum of money, and if the crop is as large as expected this year, it will temporarily tax severely the cash resources of the country.

With these extraordinary demands

## EXHIBITION VISITORS

Do not forget to inspect our stock of  
**88 Note Piano Rols**  
Perfection Rols, 6 for \$1.00.  
Planostyle Rols, 60c, 4 for \$2.00.  
Word Rols, 90c. Upward.  
We have the largest number of selections, best quality, cheapest prices in Toronto.

We Pay Special Attention to Out-of-Town Customers.  
**OCTAVE MUSIC SUPPLY**  
8 Adelaide St. East Toronto  
6 doors from Yonge St.

For funds it is unlikely that there will be a great deal of money available during the next two months for stock market transactions.

## Hens Help in the Orchard.

We find that poultry in the farm orchard helps wonderfully in keeping down the curculios and codling moths; and that a flock of chickens, with a little assistance from light tilling, will preserve a dust mulch all summer long, and keep down most of the weeds. I don't believe in giving the farm flock too much range. Give them just about what they will keep cleaned up, and no more. With too much range the grass and weeds get ahead of them. Tall grass and weeds often go uncut in the rush of farm work, and this encourages nesting out, and also provides shelter for rats, weasels, and skunks that often make serious inroads on the flock.

Chickens like shade during the hot days, and the dusting places they make are nearly always in the shade. The other day I saw a flock of White Leghorns busily tearing to pieces an old straw pile under the trees of a farm orchard. Presumably the straw was full of noxious weed seeds. The chickens had destroyed the weeds by their constant scratching. The trees bore a goodly number of apples, and seemed to be in the best of health in spite of last spring's freeze, which cut the crop short.

There is one disadvantage about an orchard for chickens: the crows and hawks have a good chance to work on the younger chickens. In this instance, however, the yards for the younger chicks have been fenced off on one side of the orchard, and various small treats and hovers were placed at intervals in the more open enclosures. This afforded handy places of refuge when the hawks swooped about.

Most of the worms that infest the orchard fruits drop to the ground, and burrow into the soil to complete their change of shape and form. Some of them fall when the leaves blow down. Chickens love a bed of leaves to scratch in, and they will destroy most of the worms in their larval stages. Even if a codling moth should drop at night, and get below the surface before daybreak, the hens know the reward of scratching and will often unearth him the next day.

## THE SUNDAY SCHOOL

### THE SUNDAY SCHOOL LESSON

SEPTEMBER 12TH.  
The Glory of Solomon's Reign, 1 Kings 10: 1-13, 22-25. Golden Text, Psalm 128: 1.

1-13. The Queen of Sheba came, it would appear, from south-western Arabia. There the old classical geographers, Strabo and Pliny, say there was a kingdom of some considerable importance, having an extensive trade in the ruins of its capital city of Nairat have been seen by some modern travellers, and show that it must have been a place of large population and wealth. Solomon's trading enterprises with Arabia and on the Red Sea may have established commercial relations between the two countries, and the queen's visit to his court may add to her purpose to put his wisdom to the test. Sheba is mentioned in Jer. 6: 20 as the place from which frankincense comes. The "traffickers of Sheba" and their trade for Tyrian wares "with chief of all spices, and with all precious stones and gold," are spoken of in Ezek. 27: 22. We read in the book of the camel caravans of Sheba bringing gold and frankincense, and in Psalm 72: 15 of the gold of Sheba that is to be given to Israel's king. Early Arabian writers delight to tell wonderful stories of this queen, of her rich country, and of her relations with Solomon.

The hard questions with which she put Solomon to the proof may have been simply riddles, or brief parables in hidden meaning, such as people of those lands still delight to repeat. Solomon told her all her questions, and so amazed his visitor, accustomed to simpler Arabian ways, with his wisdom, and his great buildings, and the splendour of his servants, and his numerous household, and his burnt offerings upon the temple altar (v. 5, margin of Rev. Vers.), that, the historian says, there was no spirit in her. It, so to speak, took her breath away. She had expected great things, but the truth was beyond all her expectations. The half, she said, was not told me.

Blessed Be the Lord Thy God. Without denying her own religion, whatever it may have been, or adopting that of Solomon, she can quite freely, according to the common way of thinking of those days, recognize the God of Solomon, and the great things which He has done. And she is herself wise enough to see that the greatest of His gifts to the king is the power to do judgment and justice.

An Hundred and Twenty Talents of Gold. In actual weight a talent of gold is estimated at about equivalent to 66,150 sterling, or more than thirty thousand dollars. In purchasing power it was worth a great deal more. The queen's gift, therefore, was a truly royal one, amounting to \$3,600,000 or more, in gold besides the spices and precious stones. No doubt she went away laden with rich gifts in return, for Solomon gave her all her desire, whatsoever she asked, beside that which he gave her of his royal bounty.

The Red Sea ships brought Solomon also rich store from southern lands. The almyg trees, or almyg wood, which is specially mentioned, may have been the fragrant red sandal wood, but this is uncertain.

23-25. Solomon Exceeded All the Kings of the Earth. If the character of Solomon and his greatness are somewhat idealized in this chapter, the chapter which follows just as truly portrays his weakness and folly. In the end it is said of him that "his heart was not perfect with the Lord his God."

The book of Ecclesiasticus (in the Old Testament Apocrypha), written about 180 B.C., well describes the career of Solomon, showing its greatness and its decline. "Solomon reign-ed in a peaceable time and was honoured about him, that he might build an sanctuary for ever." Then, as though addressing himself to Solomon, the writer continues: "How wise wast thou in thy youth, and as a fool, filled with understanding! Thy soul covered the whole earth, and thou fillest it with dark parables. Thy name went far unto the islands; and for thy peace thou wast loved. The countries marvelled at thee for thy songs, and proverbs, and parables, and interpretations. By the name of the Lord God, which is called the God of Israel, thou didst gather gold as the dust, and didst multiply silver as lead, and by thy body thou wast brought into subjection. Thou didst stain thine honour and pollute thy seed; so that thou broughtest wrath upon thy children, and wast grieved for thy folly. So the kingdom was divided, etc., etc."

## The Hot Lunch in the School

During the last few years there has been a very great many improvements made in the district school. In place of the unsanitary school house and poor teachers, proper ventilation and light and a first-class teaching staff have been ruled in. But still the nation is not contented to sit back and watch—the people desire still further to improve the conditions in the rural districts, and this time by installing a permanent system by which the children might be given a warm lunch at noon. They are not doing this in terms of pies and puddings, but are giving the children good strengthening soups with occasional dishes of rice and macaroni.

Under the best home conditions, the rural school girl's or boy's lunch is unsatisfactory for many reasons; chiefest, it is always a cold lunch. Even where a thermos bottle is carried, the extra work and time taken in preparing it, and in the child's eyes, the embarrassing contrast with his schoolmates' cold repast makes it undesirable again. Again thermos bottles are very expensive in the hands of children.

It commonly happens that the lunch is frozen on the way and may remain so until noon. At best, it is difficult and expensive to put up lunches that are well balanced. The tendency is toward too much bread and cake and too little of vegetables, fruit, protein and liquid foods.

### A Successful Experiment.

In one district school the senior teacher, who had just closed years of experience in city schools, was struck with the lack of "attack" during the afternoon sessions. The vigor seemed to grow weaker as the afternoon wore on and a seemingly unwarranted amount of effort was necessary to get any work done.

At a Parent-Teacher's meeting the teacher broached the subject and gained the support of the parents. The mothers were enthusiastic. If successful, it solved one of their constant worries, for bread and butter, a cookie and a little fruit from home with the school's hot dish would supply their children with a wholesome luncheon.

In the experiment, it was desirable to work out the problem from the standpoint of the one-room district school and the conditions that prevail there. As such it might be of value in the Movement for the Betterment of Rural Schools. Therefore the item of time must be given first consideration. Although the good derived might justify some little sacrifice of time, there is so much work to be done in the six hours for instruction that none can be spared. This extra work must be done outside of recitation hours, which means before school and at recess, as there are no "study-periods" for the teacher of the rural school.

### School Lunch Recipes.

Recipes to be used must be of very simple operation, and finally these were chosen:  
1. Potato soup.  
2. Bean soup.  
3. Vegetable soup.  
4. Rice, boiled in milk.  
5. Cocoa.  
6. Beef and vegetable stew.  
7. Macaroni or spaghetti creamed with cheese.

1. Potato soup is made simply. For twenty-five children, three pints of diced raw potatoes with  $\frac{1}{2}$  pint of onion in three quarts of cold water, are prepared before school, and put on in the twelve-quart kettle at recess, 10.15 a.m. At 11.30 a gallon of whole milk, two ounces good butter, salt and pepper are added and the fire turned low. At twelve this is piping hot and is a great favorite.

2. Bean soup requires two pounds of navy beans and  $\frac{1}{2}$  pound salt pork. This may be cut in very small pieces or left whole. The beans will make better soup if put to soak the afternoon before and put on to boil as soon as possible in the morning. Salt the soup at recess, and serve at noon.

3. Vegetable soup requires more time than any other dish but may be managed nicely by a little forethought. Prepare the vegetables the afternoon before and have them standing in cold water, or better have an older pupil or two help before school in the morning. A fifteen cent soup bone, ten medium sized potatoes, five onions, a few carrots, celery leaves, a little chopped cabbage, may be put into the big kettle with seven or eight quarts of water before school. At recess put in a pint of tomatoes, a half cupful of rice, with salt and pepper. This makes a thick mildly flavored soup, guaranteed to produce rosy cheeks. Sometimes the soup may be made with two pounds of veal shoulder and a knuckle. The lean veal is then saved, diced and mixed into boiled rice the next day. This is a dish much relished by the older pupils.

4. Two pounds of rice, washed and put on at recess in five quarts of water, boiled till half past eleven, when one quart whole morning's milk, two ounces of butter, and salt are added. If meat is not added, sugar and a little cinnamon may be served to those who like it. Rice is sure to stick to the kettle unless watched, and a "trusty" must be asked to watch it.

5. For cocoa, three quarts of milk, two quarts of water, four ounces sugar and four ounces cocoa are used. At recess heat with the cocoa, hot water and sugar. At 11.15 an older pupil

lights the fire, sets the kettle containing the milk and water onto it with the flame turned medium. At 11.45 the cocoa paste is turned into the big kettle.

6. Two pounds of beef stew, cut rather small, with a little fat and a bone or two for flavor, one quart carrots cut in coarse pieces, one pint of onions sliced, two quarts of potatoes, in pieces the size of a walnut, a little flour and five quarts of water. Put the beef and water on as soon as possible in the morning. At recess put all the vegetables in and stir up the flour thickening. At 11.45 stir in the thickening and add salt and pepper, turn down the fire.

7. Macaroni is put on in four quarts of water, cold, at recess. Milk and cheese, salt and pepper added at 11.45. Three pounds of macaroni and  $\frac{1}{4}$  pound of cheese with one quart of whole milk and two ounces of butter are used for twenty-five pupils.

No Time Wasted.  
These recipes have proved satisfactory in regard to time, taking absolutely no time away from the regular routine of school duties and very little of the recess periods.

Equipment was the next question to be solved. A two-burner kerosene stove, a second-hand kitchen table and a second-hand cupboard were purchased by the township trustee. He provided also enough cheap, large oatmeal dishes and cheap teaspoons for the entire school. Those are all the dishes that are needed, as even the cocoa may be served readily in them. A twelve-quart granite kettle, two tin dishes, a large spoon, a granite soup ladle, two paring knives, a quart dipper, an old fork, a two-quart basin and cover, three trays, from the five and ten cent store, and three dish towels completed the equipment and it has been sufficient for every need. In organizing this effort, a week's menu was planned and necessary purchases made. The menu is repeated the next week, with possibly a change on Friday. It is sent home to the mother so that she may plan the lunch to supplement the hot dish. The following has worked well:  
Monday, potato soup.  
Tuesday, macaroni and cheese or stew.  
Wednesday, vegetable soup.  
Thursday, rice.  
Friday, cocoa or bean soup.

All supplies that may be obtained in the district are brought by the pupils. Whole milk and dairy butter are supplied at wholesale prices. Vegetables are brought when available. Whole milk and good butter contain vitamins necessary to growth and no substitutes for them should be used in feeding children. This menu requires only one-half pound of butter every two weeks.

The older pupils of the school were divided into four committees, averaging four to each committee. A committee is on duty one week. Their duties are to help prepare the food, serve the dishes and wash the dishes. The boys carry in a pail of water, dispose of garbage and dishwasher and keep the oil stove clean. They also help serve the pupils and teachers. The girls help prepare the food, do what watching is necessary, help serve the food and wash the dishes. Once a week the committee renovates the cupboard and kitchen. The committee is under the close supervision of the teacher at all times and the teacher fills the dishes so that all burns are avoided (and justice upheld).

How Expenses Are Met.  
As to expenses the first month the cost was a very small fraction over three cents a dish and the second slightly under three cents a dish and the third exactly three cents a dish. The pupil pays the three cents a day and an account is made of the number of days he is served the hot dish. At the end of the month a statement is made out for each family with a record of the number of days each child has been served and credit given for any material supplied. This goes home with the report card and the money will be sent when the card is returned. This bookkeeping is very simple, all records are kept in one tablet and each month's record is complete in itself. Some of the pleasant effects noted are the improved afternoon conditions, the lengthened lunch period, better stability among the boys and girls at the luncheon hour and the grateful appreciation of the school patrons.

The work is done in a small room, originally intended for a teacher's study. To avoid clots where there is no such room available a tin holly with a chimney running out a tin window pane would be used.  
Kerosene is paid for by the township and is supplied from a patron's tank. About a gallon a week is used. A one-burner stove would be adequate, but the two-burner was chosen because on many occasions the community needs the larger stove.

In this way one of the country's greatest problems has been settled in this one little district school. We realize it will take years before the entire countryside wakes up to this necessity, but how about your community?

The only way to know the exact value of a cow is to know how many pounds of milk and butter she produces in a year. Keeping a record is not as much work as you think.

Scientists place the dog first for intelligence among animals, the monkey and the horse coming second and third.

Buy Thrift Stamps.