

# HOME COURSE IN SCIENTIFIC AGRICULTURE

## SECOND ARTICLE — THE LIMING OF SOILS.

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Experiment Station.

THE recognition of the agricultural value of certain forms of lime is not new, and it appears from the writings of Pliny that liming was practiced by the Romans more than 2,000 years ago. In England, Germany, France and other European countries the application of lime in various forms has been and is still practiced extensively, but, as Roberts states, probably 90 per cent of the arable soil of the United States has never been limed, and indeed many large areas are not in need of it.



Photograph by United States department of agriculture.  
DISEASED CABBAGE PLANT — MUCH LESS  
APT TO OCCUR IN FIELDS TREATED WITH  
LIME.

abundance of all the other essential elements is present, the plant cannot develop normally. The plant cannot grow if any one of the essential elements of plant food is lacking. Fortunately, however, many soils are well provided with lime by nature, and it is seldom or never necessary for those who cultivate them to resort to liming.

The method usually resorted to for ascertaining the amount of lime in soils is to treat them with some strong mineral acid (usually hydrochloric) and determine the amount of lime which is thus dissolved. Some writers state that if only one-half of 1 per cent is thus shown to be present immediate resort to liming is desirable; others set the amount higher, and some seem to prefer to have present as much as 1 per cent.

The fact that beets of all kinds make a ready response to liming on soils which are deficient in carbonate of lime may be utilized as the basis for a practical and reliable method of testing the lime requirements of the soil. For this purpose lay out two plots of land, each about 12 by 30 feet, manure each of the plots with like amounts of a fertilizer containing potash, phosphoric acid and nitrogen and apply lime to one of the plots at the rate of from one to two and a half tons per acre (forty pounds per plot would be approximately two and a half tons per acre). A comparison of the growth and yields on the two plots will furnish a safe means of judging whether the soil will respond profitably to applications of lime.

**Liming Sometimes Injurious.**  
Excessive amounts of lime, especially on light soils, may have an injurious action. This is particularly true of freshly slaked lime and of ground limestone upon light sandy soils, which are inclined to be dry and which contain only small amounts of organic matter. It hastens unduly the decomposition of organic matter and thus renders the soil more open and less retentive of fertilizers and moisture than before. If either ground burned lime or slaked lime must be used upon such soils it should be applied in small amounts at not too frequent intervals.

The arguments in favor of the use of lime are summarized thus:  
The use of lime as a soil improver is very ancient, and its value for this purpose is generally recognized. Its action as a fertilizer is both direct and indirect.

There are many soils in which lime is deficient, notably such as are derived from granite, mica schist and certain sandstones, slates and shales. On such soils lime is often of direct value in supplying a necessary element of plant food.

becking the unavoidable porous, phosphoric acid and nitrogen in the soil.

Lime exerts a decided influence on the mechanical condition of soils, rendering heavy compact soils looser in texture and tending to bind particles of loose, leachy soils.

Lime is also beneficial in furnishing conditions in the soil favorable to the activity of the micro-organisms which convert the nitrogen of organic matter into nitrates which are readily assimilated by plants which decompose organic matter and which assist certain leguminous plants to assimilate the free nitrogen of the air.

One form of lime (gypsum) has been shown to be a most effective corrective of black alkali.

The continued use of lime unaccompanied by other fertilizers may prove injurious, especially on poor soils, since it converts the insoluble nitrogen, potash and phosphoric acid compounds of the soil into such as can be rapidly taken up by plants or washed out in the drainage, thus hastening the exhaustion of the supply of these substances in the soil. As the German sage states, "The use of lime without manure makes both farm and farmer poor."

### Behavior Toward Lime.

It has been shown that even upon many upland and naturally well drained soils, apparently in good condition otherwise, the sourness (acidity) is so great that most varieties of plants will not thrive. Lime is the most economical and effective substance thus far used for correcting this condition. According to experiments made by the Rhode Island agricultural experiment station on acid soils in that state, the plants tested may be classified with regard to their behavior toward lime as follows: Plants benefited by liming, spinach, lettuce (all kinds), beets (all kinds), okra (gumbo), salsify (vegetable oyster), celery, onion, parsnip, cauliflower, cucumber, eggplant, cantaloupe, asparagus, kohlrab, cabbage, dandelion, Swedish turnip, pepper, peanut, English or flat turnip, upland cress (peppergrass), marjula, rhubarb, common pea, pumpkin, summer squash (scaloped), golden wax bean, red Valentine bean, horticultural pole bean, bush lima bean, lentil, Hubbard squash, salsify, hemp, tobacco, sorghum, alfalfa, clover (red, white, crimson and alsike), barley, emmer, wheat, oats, timothy, Kentucky blue grass, Canada pea, Cuthbert raspberry, gooseberry, currant (White Dutch), orange, quince, cherry and Burbank Japan plum; plants but little benefited by liming, Indian corn, spurry (it has been reported in England that spurry is injured by liming, but such results have not been obtained in Rhode Island), rye, carrot, chicory, Rhode Island bent and redtop; plants slightly injured by liming, cotton, tomato, cowpea (drummond), Concord grape, peach, apple and pear; plants distinctly injured by liming, lupine, common sorrel (Rumex acetosella), radish, velvet bean, castor bean, flax, blackberry, black cap raspberry and cranberry.

### Frequency of Liming.

The frequency with which liming should be practiced depends, among other things, upon the character of the soil and the rate of application, the number of years involved in the rotation practiced, the plants grown and their order of succession. As a general rule, it may be stated that from one-half to one and one-half tons of lime per acre every five or six years is sufficient. Applications of two or three tons may, however, be advisable in cases of very acid soils which are to be seeded down and are to remain in grass for several years. The practice of applying small amounts of lime at somewhat frequent intervals is being generally accepted as preferable to the use of large amounts at rare intervals.

Lime combined as carbonate, as in marl, wood ashes, etc., can usually be applied with safety in the spring or at any other season of the year, but autumn is always the safest time to apply caustic or slaked lime. It is gen-



Photograph by United States department of agriculture.

**WASTEFUL METHOD OF STORING MANURE.**  
Generally considered best to apply the lime to the soil immediately after plowing and harrow it in thoroughly. Lime which is already slaked may be spread upon the soil directly from wagons or carts or dumped into heaps and then spread with a shovel, although the most satisfactory plan in such cases is to use a lime spreader or ordinary grain drill with a fertilizer attachment. Where a lime spreader or similar implement is not available the burnt lime may be placed on the soil in piles of from forty to fifty pounds each, covered with moist earth and allowed to slake before being spread with a shovel.

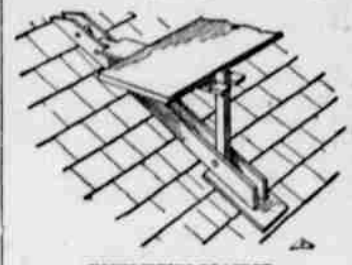
In conclusion, it may be said, since in first whether lime is needed, it is applied judiciously, and never dependent upon lime alone to maintain the fertility of the soil, for all of the ingredients which plants need must be present in the soil to insure the profitable production of crops.

## SCAFFOLD BRACKET.

Nonslipping Device Insures Safety on Sloping Roofs.

Almost 40 per cent of the accidents in building operations are due to inadequate construction of false work and scaffolding. In building frame structures accidents of this nature show even a larger percentage, says Popular Mechanics. The fault is not always laid at the door of the contractor, for workmen will often take risks that endanger their lives without any good reason other than to save time and labor. A carpenter who builds his own scaffolds is often as careless as any one in this respect.

Shingling roofs is even more risky than framing the house. Where the pitch is sharp the risk is greatly enhanced. In repairing roofs a good



NONSLIPPING BRACKET.

many carpenters do not even go to the bother of building scaffolds, but depend upon their ability to hold themselves on the slope. If one had folding brackets, which would make roof shingling simple and safe, fewer accidents of this nature would be recorded. A carpenter with a pair of folding brackets as a part of his equipment would never be in danger of slipping or sliding from the roof while shingling. His equipment would consist simply of a pair of brackets and a board.

The brackets, as illustrated, are made to fold up and are self sustaining. That is, the board which fits against the slant of the roof is spiked to cling to the surface and it would take a good deal to break it loose from its moorings. The spikes are made of ordinary screws with the ends protruding one-quarter of an inch beyond the flat board and filed to a sharp point. Three of these at the lower end of the bracket and two at the upper end serve to hold the brackets firmly in position. A slight tap of a hammer will drive the brads in sufficiently and when the scaffolding board is placed across the brackets the thrust, being downward, tends to push the points of the spikes deeper into the wood surface. A pair of brackets of this nature will sustain the weight of several men working on the same board. The illustration shows clearly the construction of each bracket.

## A WONDERFUL CLOCK.

Radium Driven Timepiece Could Run For Centuries.

It is claimed that if not touched the radium timepiece invented by the Englishman, Harrison Martingale, could run for 30,000 years. On a quartz rod, in an exhausted glass vessel, is supported a tube containing a small quantity of radium. An electroscopie is attached to the lower end of this tube. It consists of two long strips of silver. The natural action of the radium sends an electric charge into the strips and causes them to separate until they touch the sides of the vessel, where they are instantly discharged and fall together again. Every two minutes this operation is repeated automatically, so that each beat of this wonderful timekeeper is in reality two minutes long.

The most trustworthy clock in the world is said to be that in the basement of the observatory at Berlin, installed in 1805. This clock is inclosed in an air tight glass cylinder and has frequently run for two or three months, with an average daily deviation of only fifteen one-thousandths of a second. Yet astronomers are not satisfied even with this remarkable accuracy, and their efforts are constantly in the direction of more ideal conditions for a clock, by keeping it not only in an air tight case, but also in an underground vault, where neither changes of temperature nor of barometric pressure can ever affect it.

### To Repair Tungsten Filaments.

As persons using the brilliant tungsten filament electric lamp have reason to know, they are easily broken by a sharp jarring of the bulb. So delicate is this tungsten burner that in spite of the better light many householders feel they cannot afford them, or, if using them, make sure that they shall hang pendant from a height above the ordinary chance of one's striking the chandelier with head or broom handle or duster. Recently an inventive person has discovered that in the case of a broken tungsten filament a light tapping of the bulb, allowing of the broken ends to come in quiet contact from the vibration, will result in the filament's broken ends coming in contact and fusing fast again. Of course the current at the time must be turned on.

### England's Youngest Bride.

The youngest bride who was ever led to the altar in England, so far as we can discover, was little Catherine Apsley, who had only seen four summers when she became the wife of the first Earl Bathurst, who was exactly double her age. The tiny ring worn by Catherine on this occasion, over two centuries ago, is still preserved. Lord Bathurst survived to see the eighty-third anniversary of his wedding day, while his lady was a wife for seventy-six years.—London Chronicle.



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are made of selected, high-grade material throughout. The lumber is air-dried in huge sheds for three years or more before it is used. Air-drying takes years of time, and leaves the fibres of the wood filled with and cemented together by the natural resinous residue of the sap. Kiln-drying requires only a few days' time and leaves the wood brittle and weak. Air-drying produces elastic lumber, wagon parts that bend and give under loads and strains, but that spring back when the strain is removed.

Weber and Columbus wagons have wood gears; New Bettendorf and Steel King have steel gears. The I H C local dealer will give you literature and full information about the wagons he sells. See him, or, if you prefer, write

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Notice of Contest.  
Department of the Interior,  
U. S. Land Office, The Dalles, Ore.,  
April 2, 1913.

To George W. Weddle of Prineville, Oregon, contestee:  
You are hereby notified that Emerlen M. Young, who gives Prineville, Oregon, as her postoffice address, did on March 20, 1913, file in this office her duly corroborated application to contest and secure the cancellation of your homestead, entry No. —, serial No. 08300, made June 12, 1911, for s1 nw1, s1 nw1, s1 nw1 section 22, township 14 south, range 16 east, Willamette Meridian, and as grounds for her contest she alleges that said George W. Weddle has wholly abandoned said land for over six months last past; that he has wholly failed to reside upon, improve or cultivate said land as required by law or at all for six months next preceding the filing of this contest; that said claimant has not been absent from said homestead by virtue of the act of June 6, 1912, or upon notice filed in your office relative to such leave, and for the reasons above stated is now wholly in default thereof.

You are, therefore, further notified that the said allegations will be taken by this office as having been confessed by you, and your said entry will be canceled thereunder without your further right to be heard therein, either before this office or on appeal, if you fail to file in this office within twenty days after the FOURTH publication of this notice, as shown below, your answer, under oath, specifically meeting and responding to these allegations of contest, or if you fail within that time to file in this office due proof that you have served a copy of your answer on the said contestant either in person or by registered mail. If this service is made by the delivery of a copy of your answer to the contestant in person, proof of such service must be either the said contestant's written acknowledgment of his receipt of the copy, showing the date of its receipt, or the affidavit of the person by whom the delivery was made stating when and where the copy was delivered; if made by registered mail, proof of such service must consist of the affidavit of the person by whom the copy was mailed stating when and the postoffice to which it was mailed, and this affidavit must be accompanied by the postmaster's receipt for the letter.

You should state in your answer the name of the postoffice to which you desire future notices to be sent to you.

C. W. MOORE, Register.  
Date of first publication April 10.  
Date of second publication April 17.  
Date of third publication April 24.  
Date of fourth publication May 1.

Notice to Creditors.  
Notice is hereby given by the undersigned, the administrator of the estate of Samuel S. Jones, deceased, to all creditors of said deceased and to all persons having claims against said estate to present them with the proper vouchers to the undersigned at the office of M. R. Elliott in Prineville, Oregon, within six months from the first publication of this notice.  
Dated this 3d day of April, 1913.  
CHARLES E. JONES,  
Administrator of the Estate of Samuel S. Jones, Deceased.

**Duroc Jersey Pigs**  
Fifty head, thoroughbreds, either sex, at my ranch at Powell Butte, Address G. L. Braze, Redmond, Oregon.  
4-10-6tp.