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R.M.

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96.1 per cent in number and 99.9 per cent. in damage. The damage was stated as being due chiefly to side-flash.

Some persons have hesitated to erect rods because of the idea—somewhat prevalent—that a lightning rod may easily change from a complete protection to a menace because of some mechanical defect in the system. This idea has been proven to be entirely erroneous and that though mechanical defects are by no means to be desired they do not, as soon as they appear, necessarily make the rod into an added danger.

It would undoubtedly be to the advantage of all if some method could be devised of licensing those selling and erecting lightning rods so that all rodding would have to be inspected and approved by the Canadian Board of Fire Underwriters before payment was made. This would give the public some guarantee that their rods were erected in accordance with the latest approved methods and that they would get protection when they got rods.

Lightning rods are usually subdivided under three parts: 1. The air terminal or point; 2. The rod or conductor; 3. The earth terminal or ground. The prevailing practice in the United States and in Canada has been to use either copper or iron for the rods. Aluminum has been used but rarely and rods of two metals combined are not recommended as being less durable than rods of one metal as they are subject to electrolytic action.

The physical properties of the three metals are as follows:

	Copper	Aluminum	Iron
Specific gravity.....	8.8	2.7	7.7
Melting point.....	2012 F.	1157 F.	2840 F.
Conductivity.....	100	48	16

Copper is the best available conductor of electricity and as one of the important qualities of a rod is resistance to both atmospheric and soil corrosion, copper has been used very extensively. The corrosion by smoke and gasses can be prevented by coating the exposed portion, as near a chimney, with lead. The question of resistivity has been much discussed, but it is claimed that as the earth terminal has a much higher resistance than the rod that this quality in a rod is of very great importance.

Aluminum stands next to copper in conductivity value and is not easily corroded, but it is very sensitive to the action of alkalis. It is also highly electro-positive, so that when used all the parts should be of this metal in order to avoid galvanic action.

Iron has the advantage in high-frequency resistance and in price, and it is no doubt that it is the latter quality that has often caused iron to be selected. In order to make it durable it must be coated with a heavy coating of zinc.

The Fire Underwriters require approved "standard" rods, if of copper to be in the form of a flexible cable or a rigid tube, bar or rod; if it be of steel to be of the twisted star section form. The weight of the copper cable to be not less than 3 oz. to the foot (187.5 lbs. per 1,000 ft.) with the individual wires of the cable not less than 0.45 inch in diameter and may be of the rope lay, loose twist or braided type with or without a supporting core. If a rigid tube or bar is used the weight must be the same as for the cable. The star section steel is to be of mild steel of 3/4 inch diameter from point to point and weighing not less than 320 pounds per 1,000 feet of length. It must be coated with 20 pounds of zinc per 1,000 feet.

The above weights are for structures not exceeding 60 feet in height; for those over 60 feet and not exceeding 150 feet the above weights must be doubled and if over 150 feet they must be trebled. There should be as few joints as feasible and these must be mechanically and electrically secured and protected from corrosion.

No insulators should be used as the rods are intended to be in metallic connection with the building in order that the charge may flow up the rods to the points and into the air. All the large metal surfaces such as eaves-troughs downspouts, water and drain pipes should be connected to the rods and thus assist them in collecting and dissipating the electricity.

Air terminals or points are required within two feet of each chimney, cupola, ventilator and gable and an additional terminal spaced not over 25 feet apart on all roof ridges. These points must be very securely fastened to the structure to prevent them being blown over or damaged as it is most important that they be held in a vertical position.

Earth connections or grounds are the portion of the system needing most attention as once covered over, any defects will not be seen. They must be taken down to permanent moisture, usually from 8 to 10 feet below ground level and in any case well below the footings. Efforts should be made to obtain the lowest possible resistance consistent with economy.

Damage to the rods, where they enter the ground and if near doorways, should be prevented by boxing around same or by some other method and care should also be taken to prevent seepage from manure pits corroding the metal.

The number of earth terminals required is dependant upon the number of the air terminals. If the air terminals do not exceed six, two ground terminals are usually sufficient and should be at diagonally opposite corners. Three terminals to be provided where more than six points and not more than twelve are used, and an additional terminal for each five points after the first twelve.

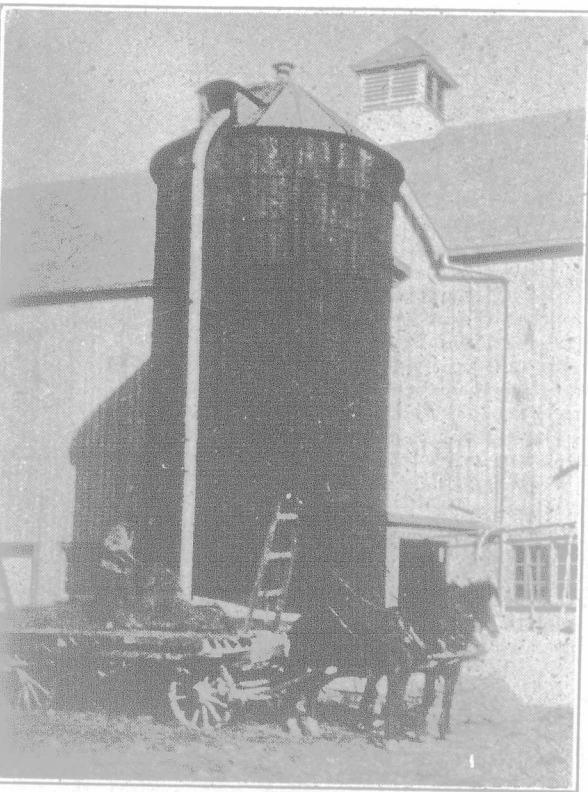
The above gives an outline of the practice at the present time, for the installation of lightning rods in Canada

and the United States, and any further investigations made to bring about greater uniformity of practice should be encouraged.

A New Trouble for Owners of Rented Farms.

EDITOR "THE FARMER'S ADVOCATE."

A call came recently to the Seed Branch, Department of Agriculture, Ottawa, asking for the services of an inspector to look over some oat fields that a tenant farmer had sown with oats bought from a neighbor but badly polluted with wild mustard seed, although the writings forbade the sowing of any foul seed on the farm during the length of the lease. The owner had

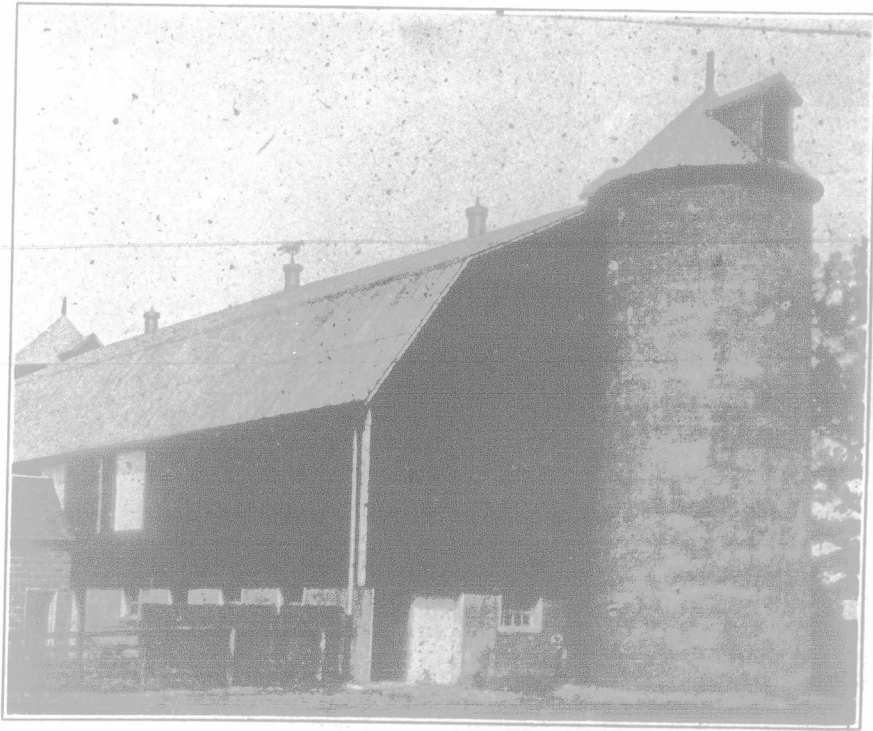


Silos of this Type are Durable, Neat and Generally Satisfactory.

only to deal with odd spears of mustard previously and now he looked forward to a continual fight with this weed the rest of his life, with the chances against him for total eradication. The tenant had not shown very much willingness to try to make amends by pulling it, and although the crop was not very heavy he didn't feel like plowing it down as the owner advised.

The sending away for help seemed to furnish the magic for almost its entire disappearance. When the writer and owner went out early one morning to estimate the damage and suggest what was best to do, we were agreeably surprised to see that the mustard had disappeared excepting a few small plants here and there. The tenant and his wife had spent a day even with a down-pouring rain in pulling it out, as large bundles of the weed in fence corners testified, and a promise was obtained to still further supplement the work. I was thinking the owner was fortunate that the weed was mustard, for what if it had been bladder campion? In some parts of Ontario it might have been in uncleaned oat seed and he wouldn't have known about it.

This is a weed that is spreading very fast over the Province, and is contaminating too much red clover



The Cement Silo is a Very Popular, Neat and Attractive Type, and is Rapidly Increasing in Numbers.

seed, sweet clover seed and alsike. Farmers will do well to examine or have examined for them the seeds they are sowing or have sown on their farms. The Seed Branch renders a free service in this regard, and there is really no excuse for ignorance or carelessness in this matter, as samples are even carried free through the mails to Ottawa. T. G. RAYNOR.

THE DAIRY.

Silage the Dairyman's Standby.

There is an old saying that the proof of the pudding is in the eating, and if this test is applied to the value of a silo on a dairy farm, it will work out very much to the advantage of the silo. It is estimated that there are between 400,000 and 500,000 silos in use on the farms of the United States, and while no estimate has been made for Canada that we know of, the number is rapidly increasing. Many dairy farms in Eastern Canada now have more than one silo, and during 1919 cheese-factory patrons in Eastern Ontario alone built 264 new silos. Silos are naturally to be found in greatest numbers in the recognized dairy districts, and it has virtually come to be recognized as a sign of a prosperous dairy district when the use of silos is noticeable from the roadsides. Even on the prairies where live stock and mixed farming are not yet fully established the silo is fast getting in its good work, and a recent report marked the establishment of at least 150. It is probably not far from the truth to estimate that in a dairy county like Oxford there are at least 3,000 or 4,000 silos. The rapid increase in the number of silos being built annually is sufficient proof of their value, especially since the silo is not a new thing in Canadian agriculture, but has for nearly a quarter of a century been proving its worth in reducing feed bills and decreasing the cost of producing milk. The best advertisement the silo can have is the large number of satisfied users. Silage has come to be recognized as the standby of the dairy farmer on account of its bulk, succulence, palatability and economy. These four factors constitute the basic requirements of dairy cattle feeds and need only be supplemented by concentrates of the desired character to properly balance the ration.

TYPE AND SIZE OF SILO.

Having decided on the necessity for a silo one must next decide what kind of a silo shall be built. Here we run up against the choice of materials, such as wood, cement, hollow tile or brick, as well as the general type of construction. Before deciding whether the silo shall be of concrete or brick, or whether it shall have a roof or not, it is necessary to bear in mind the fundamentals of a good silo. The silo is really a storage for feed, and should be built so as to combine economy with durability and a water-tight, air-tight condition inside. Experience has shown the advisability of the round or nearly round silo with smooth, perpendicular walls. Another very essential condition is that the silo must be of the proper capacity to hold sufficient silage for the requirements of all the stock to be fed, and that the diameter must be no greater than will provide the silage necessary for a day's requirement without spoiling. So far as we know, no material is best for silo building, provided the silo is properly constructed. Each man must decide for himself and base his decision on the above factors along with personal preference.

The size of the silo cannot be estimated unless one knows the daily amount that will be required. This may be determined from tables I and II, which give the daily amount consumed by various classes of stock and the amount that must be consumed daily for silos of different diameters. These tables will suffice for determining the diameter of the silo, while the height can be determined by the length of time silage will be fed and by the total annual requirement in tons. The condition of the corn when ensiled and the rate of filling will each influence the capacity. In addition, the silo should be higher than is actually necessary to hold the silage required in order to allow for settling. If a second filling is made the extra height will not need to be so great, but where only one filling is given a 30-foot silo will settle 5 feet or more and where a solid roof is provided for the silo, as it should be, this much extra height will have to be provided. Generally speaking, the height should be two or three times the diameter and should not be much less than 30 feet to secure the greatest economy in capacity. It is usually a good plan to start building the silo from 4 to 6 feet below the level of the ground as this makes it unnecessary to build the silo so high.

THE PRESERVATION OF SILAGE.

The weight and value of silage are closely related. Weight, however, is primarily dependent upon the amount of moisture contained in it, while the value of the silage