

Sixteen rafters, 2 x 4 inches, and 10 ft. long; no braces. Covered with galvanized iron sheets cut to lap on rafters. Dormer window on north side for taking in blower pipe, and another over feed chute for light.

Openings for taking out silage covered with 2-inch Georgia pine, dressed with overlapping tongues.

Silage kept good. No waste whatever around walls.

Roof cost \$30, including labor. Total cost of materials and contract for laying walls, floor, and cement washing inside, about \$200.

No serious trouble with freezing, though silo very exposed on north side. About six inches froze, but all taken off and fed. In taking out, silage was kept well down around the edge.

A Grain of Corn.

The accompanying illustration is a reproduction of a large chart used by Prof. Klinck, of Macdonald College, Que., in a most instructive address at the Ontario Corn Show. To see the absorbed attention, for hours, of a roomful of men who have grown corn all their lives, while Prof. Klinck discourses on the constituents of a kernel of corn, the shape of grain most profitable, the form, size and proportion of ear most desirable, is to get an insight into the interest that can be aroused on a seemingly insignificant subject by one who is thoroughly posted and enthusiastic himself.

The illustration shows the ideal shape for a kernel of dent corn. It is headed "Low-protein Corn Kernel," in contradistinction to a grain of high protein content, in which a large amount of the crown starch would be displaced by horny starch.

It will be noticed that the greater part of this kernel is starch. At both crown and tip it is the substance most abundant. When open, it appears floury. The small amount of protein that is present is contained in the horny starch on

particularly in the layer of horny gluten which underlies the hull all around the grain.

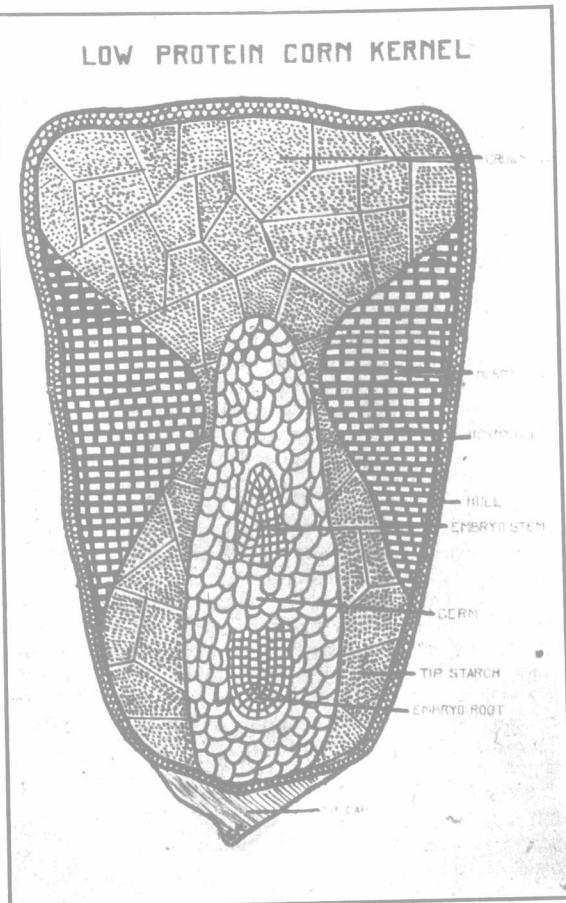
American breeders of seed corn have succeeded, by increasing the percentage of the parts in which protein is found, in developing corn considerably

either side (marked off into squares), and more richer in nitrogen than the ordinary varieties, and, therefore, more palatable, and a better-balanced food.

The lower central portion is the germ, and in the center of this the embryo corn plant is seen. Expert judges, by examining the germ, can be reasonably sure whether the corn is vital or not. If, on cutting it with a knife, the germ is seen to be plump and of a fresh creamy color, and cuts cleanly like cheese, good germinating power is indicated. On the contrary, if the germ is shrunken, is of a dark or a soapy dead color, and draws under the knife, instead of being cut into easily, the life has gone out of it. In all likelihood it has been frozen before it was dry. If seed corn is dry, thoroughly dry, and kept so, frost will not injure it. But even where dryness is well assured, it is well to keep it where extremely low temperatures are not reached. The germ is the most nutritious portion of the grain, being rich in oil. Mice know this, and that is why they eat out the germ first, leaving the other portions for a time of greater need.

The tip cap, which covers the lower end of the kernel is but a chaff. When corn has not been thoroughly matured, the tip-cap may adhere to the cob when the grain is being shelled, and the grain then shows black at the lower end. This black layer is present in all corn, but is unseen if the tip-cap be not removed. Corn is not necessarily lacking in vitality when it shows black in this way. Immaturity only, with but slightly-weakened germinating force, may be indicated. But such seed is more likely to be injured by a cold wet spell after being planted. The germ lacks the protection which the tip-cap is intended to give for a time. If conditions at planting-time are favorable, however, germination takes place more quickly, as the moisture more readily affects the germ.

The thin lines running through the crown starch and extending from the upper end of the germ to the shoulders, are intended to show how far up the horny starch extends in high-protein corn.



BAD ROADS AND THEIR IMPROVEMENT.

First Prize Essay.

It is scarcely necessary, in considering the question of road-improvement, to give more than passing notice to the social drawbacks and economic losses to the farming community because of bad roads. These disadvantages have been before the experienced public for so long, and they have been expressed and repeated so often, that they have taken shape in the agitation for road improvement, which, let us hope, may soon materialize in some scheme of greater assistance and more effective effort than any time in the past has seen.

How few farmers have not realized the "splendid isolation" which they suffer in social life because of impassable roads at certain seasons of the year; heard the murmurings of their young people for conditions which afford greater social intercourse, such as the easier distances urban life offers; experienced the difficulty of punctual and regular attendance of children at school, and of the family at church or social gatherings?

And, economically, who does not know that good roads afford access to markets at all times, give us advantage of best market prices, are economical of time, save wear and tear of vehicles and strain of horse-flesh, and place our purchases at our doors at a minimum of cost for transportation? Every carrying company, from the business standpoint, to reduce cost of transportation, reduces its railway grades, or increases the capacity of its carriers, or both, to give to its motive power the greatest possible effect; and the men who use the roads must get this result in the same businesslike way.

In any scheme of road improvement that is suggested we must consider certain factors that enter into the cost and practicability of any method adopted. The cost and accessibility of road metal, and the extent of travel on the road, are the principal of these factors. Some sections are entirely without road metal. What is used must be hauled in by railway, if metalling is to be done; and one of the matters which should have the concerted attention of municipalities is an effort to seek a reduction of freight rates on road metal, that the cost of hauling for moderate distances shall not exceed the first cost of the material hauled.

Another factor which has checked progress in road-building is that all our municipalities are now, and for a few years will be, confronted with the problem of replacing the old wooden bridges with new, permanent ones, costly in construction. Few municipalities will permit their councils to incur the indebtedness caused by the issue of debentures for this purpose, or to levy a heavier immediate tax. Both public bodies have signified their desire to assist the Provincial Highway

Department from the Federal and Provincial Treasuries, in road-building. We know of no more valued assistance that can be given municipalities than immediate and substantial grants to the reconstruction of these bridges according to approved plans. The removal of these costly annual outlays from every municipality's treasury will be one of the best sources of encouragement to the improvement of our bad roads that can be undertaken.

The division of responsibility for construction and maintenance of highways seems to be a serious barrier to procedure. None deny the need for better highways. Few say we should not have State aid, either Federal or Provincial. More—and, we believe, the great majority—believe that the control of the roads should remain with the municipality, and State aid be granted to these, rather than that the Provincial and Federal Governments should assume and be responsible for a system of highways. In a country so thinly populated as Canada, and even in old Ontario, Provincial highways are scarcely practicable.

In any scheme of organization for better road management, in which the municipalities retain control of and liability for their highways, a classification is necessary, and this classification can best be made according to the travel thereon. The most expensive roads to maintain are usually the most heavily travelled, and the cost of maintenance decreases as travel is lessened. In Denmark, the amount of average daily vehicular traffic is the determining factor in classification, as first, second, third, or fourth class. First-class roads are those near towns or larger villages, with a daily passage of at least 100 vehicles, including heavy traffic, and built according to a standard specification based on the requirements of travel. Second-class are generally subsidiary to or extensions of number one, and are those frequented by from 50 to 100 vehicles of less heavy goods transport, and consequently built according to a lighter standard. Third and fourth classes are those with less travel. Cannot Canadian roads be subject to a similar classification, giving us first, second and third-class highways? Roads of the first class will be the most costly to construct and maintain. The roadway must be wider and of heavier wearing surface, because of the travel, and our suggestion is that, on these roads of the first and second class, the Provincial Government make grants for both construction and maintenance, on the following basis, viz.: 40 per cent. of the cost of bridges and culverts, drainage, grading and metalling with gravel, and 50 per cent. of the cost of metalling with crushed stone, rolled and finished according to the specifications of the Provincial Highway Department. The matter of the classification of the highways may be determined by the Department of High-

ways in each Province, which will also prescribe regulations under which these assisted roads shall be constructed and maintained, in order that its grants may be participated in. In this scheme we suggest that any Federal assistance given shall come through the Provinces.

Roads of the third class shall still be wholly maintained by the local municipalities. The matter of maintenance will be determined by local conditions. Where gravel deposits are convenient this is not a matter of such serious concern, but where gravel is scarce and earth roads are the rule, a judicious use of the split-log drag, both in shaping and maintaining the grade, will be the most modern and practicable method of improvement. Where gravel roads are to be maintained at least cost, the use at the proper season of a drag which has been "bitted" with steel will give effective results, as will also the use of the light two-horse grader. The center of the road is kept filled, the water allowed to run off quickly, and the durability of the road thereby much increased. With these methods, the commutation of the statute labor yet in existence in many townships, will maintain in a much more passable condition than at present the roads, which would wholly devolve on the township.

The merits of the proposition, as to classification and improvement, suggest themselves. The assistance covers all the main features which make road-building costly. The percentage of assistance for metalling first and second-class roads takes into consideration natural advantages as to location of gravel, and the cost to some parts of the country where stone or metal has to be imported; for, where metal must be hauled into any locality, the 50 per cent. grant will induce the use of the better material. Then, the general public throughout the Province are contributing to the construction and maintenance of roads that all use and are feeders of the towns and cities. The local grievances as to the arbitrary designating of highways to be assisted is removed. The travelling public unconsciously do this, and no interest or locality can claim assistance to which it is not entitled, if a proper classification is made.

The advantage of this proposition over that of a Provincial system of highways connecting country towns, as suggested, is that this assumes that the object of our highways is to serve as feeders of our railways, can be used by all to serve all, and will give every municipality assistance from the General Treasury in constructing and maintaining roads that have been a burden to the local municipality, if they have been improved at all.

The one other question which arises is whether the county or township municipalities should assume management of these assisted high-