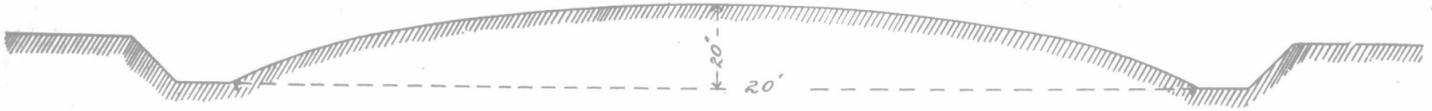


Improving Earth Roads.



Cross-section of an Earth Road.

The rounded center and sloping sides permit free drainage of the road surface. The open drains may have greater or less depth and capacity, according to the amount of storm water to be carried. Tile drains, if required, may be laid under the open drains to get the greatest depth with minimum excavation; on a two-per-cent. grade, lay the tile under the shoulders, where the filling will not be washed out; on hills put one tile drain down the center of the road. If stiff clay, fill over the tile with gravel, coarse, sharp sand, or other porous material.

W. A. McLean, C.E., Engineer of Highways, Department of Public Works, Toronto, who judged the split-log drag competition in 1907.

The split-log drag should at this season be in active use wherever there is a clay road. The implement is so exceedingly simple to make, and is so easily used, that neither the initial cost nor the time required to operate it form a sufficient excuse for leaving earth roads during the summer in a rough, rutted and flat condition. Earth roads, other than light sand, make the best of summer roads for moderate traffic, especially if cared for with the drag. Many of the roads which last year were entered in the drag competition, were kept like trotting tracks for the season, and became the main roads of the district, attracting much travel which had formerly followed other lines.

Clay roads in the early spring and in the fall cannot be other than mud roads, yet if well maintained during the summer season, they produce in a remarkable measure the benefits of good roads. Experience in Wentworth County, and in other counties where stone roads have been constructed, shows that the property along these improved roads is increased in value as much as fifty per cent. The same cannot be claimed for the results of the split-log drag, but considering the percentage of returns upon the outlay, the use of the split-log drag is an investment which no farmer can afford to despise, if he cannot at once secure a good macadam or gravel road. No farm looks its best when viewed from a road axle-deep in mud. No farm shows to good advantage from a road that is rutted, shapeless, and hard to travel. To give to home life reasonable social privileges, to increase property values and readiness of sale, to make the most of the farm as an income producer, good roads are a necessity.

By means of the split-log drag, earth roads will dry up more quickly in the spring. They can be kept smooth throughout the summer, with less dust and less mud. They dry more quickly after a rain, and maintain a firm condition longer in the fall. When nicely crowned and in neat alignment, they have a trim appearance, in keeping with a good farming community.

If the road past your farm has never been properly graded, or if it has become flat and shapeless, arrange, if possible, to have the township grading machine sent early in the season to grade the road, crowning and rounding it up well in the center, and forming the water tables. When this is done, it is the province of the split-log drag to keep the road in shape. The grading machine is an implement of construction; the split-log drag is an implement of maintenance. If the services of a grading machine cannot be secured, the split-log drag will do the work, but with an expenditure of more energy and time than would otherwise be required.

If the split-log drag must be used for all the work, the road should be lined out with the plow, and two or three furrows turned wherever any quantity of earth must be drawn in, to crown the road and form the open drain. When the furrows have been turned over, cut the loosened earth with a disk harrow, and draw it in by degrees, a small quantity at a time. By dragging often enough to keep the central part of the road smooth, and drawing in as much loose material as can readily be handled, an astonishing improvement will in a short time result.

The drag should be used as early in the spring as possible. The effect is to squeeze the water out of the surface of the road; that is, the lumps and ridges are cut off and are forced into the holes and hollows—a process which forces the water off the road and leaves it smooth, so that it dries quickly and is in shape to shed any further rain falling on it.

The object of using the drag is not to draw an immense amount of earth to the center at each operation. That work should be done by the grading machine. The split-log drag is at its best when used only to smooth the road and to draw a sufficient quantity to the center at each time, to make up for any settlement or spreading of the road which has occurred. To get the best results, the drag should be used as often as possible; that is, as often as the soil is in a fit condition. Do not wait until a road is rough and rutted, but use the drag, if possible, after every rain, even if the road is comparatively smooth. In this way

the road never gets out of repair, and one round of the drag will suffice, where two or three would otherwise be necessary. By using the drag often, and when the soil is in the best condition for its use, it is comparative play to operate it on the road; but if the road is left until rutted and cut up, to restore it to shape becomes laborious, and the results are not so satisfactory, nor so permanent.

Last year's competition indicated that the best time to use the drag is after a rain, when the surface is partially dry and the soil mellow. If used too soon, there is a stage when the soil is sticky and will roll up in lumps with very unsatisfactory results. It



A split-log drag, operated by W. B. Rittenhouse, of Beamsville. When in use, boards may be laid over the cross-bars, the driver standing on them.

has frequently been urged that the drag be used when the soil is extremely wet and slushy. Mr. John Young, of Abingdon, the winner of the first prize in Western Ontario, was the only one who thoroughly demonstrated the value of using the drag when the roads were in this wet condition. But he used the drag while the rain was still falling, and he had not let his road get rough. He used the drag immediately after, or during the rain. The result, after using the drag in the rain, was a tough, rubber-like surface, showing



A clay road kept in excellent condition during the summer of 1907, by John Young, Esq., Reeve of Caistor Township. A clay road can be kept at its best during the summer by using a split-log drag, but in the spring and fall, mud is inevitable. The roadside has also been neatly levelled.

the true effect of "puddling." To use the drag in this way is not a method which is likely to be received with general favor; so that as the second best method, the drag should be used just after the sticky stage is passed, when the surface is beginning to dry, and the soil below is moist.

The best form of drag is a matter which received much careful attention from those using it last year. One competitor, Mr. W. H. Speers, of Halton Co., has used for some years a triangular form of drag. This is very effective in cleaning out the open drains, and in drawing a considerable quantity of earth to the center of the road. It is, however, heavy and cumbersome, and requires two drivers and two teams of horses. A four-bladed plank drag was used by Mr. Matthew Wil-

liamson, also of Halton Co., who believes that it rides over and drops earth into the hollows more effectively than does the split-log drag. A similar type of drag was used by Mr. H. W. Park, of Wentworth Co. Drags of this description are good when the construction of a road is principally in view. Yet the great point, and one which requires emphasis, is that the essential value of the split-log drag lies in the fact that it is a light implement, easily handled by one driver and one team of horses, and can be used at the right time after every rain to maintain an earth road in its best possible condition. If construction is aimed at, some of the heavier forms of drag may be more effective than the split-log, but none of these can compare in this respect with the grading machine for general use. The common split-log drag is as yet unsurpassed, in the writer's opinion, by any other form of drag for maintenance only, under ordinary circumstances.

One form of drag has been made with the face sloping from the top backward, in such a way that the drag will tend to slide over a road when in a sticky state. The same result is reached, or practically the same idea is carried out, if a split-log is used, by reversing the drag and drawing the round faces forward, in this way permitting the drag to slip more easily over the surface of the road. Handles may be put on the drag, and in one case a lever was used, attached to the front of the central crossbar, and resting on the rear blade, and so arranged that it could be swung and used to press downward on the rear blade.

One of the most important improvements on the old form of drag is to so set the front and rear slabs with respect to one another that when the drag is in use, the ends will be nearly parallel with the sides of the road. With the common square form of drag, the rear slab projects, will catch on sod or the sides of the ditch, and thus interferes with the work of the front blade. When made in this improved form, diagonal braces are desirable at the ends.

A steel plate is advisable along the front edges of both front and rear blades, to preserve the drag from wear, and to make a more effective scraping or cutting surface. Some question has arisen as to whether the plate should be used on the rear blade, and whether it should extend the full length of the blades or not. Some suggest that the blade should be used only at the outer end, where the most cutting is required; that the steel should be below the wood at the outer end, and flush with it near the inner side at the crown of the road. As the steel is necessary principally to preserve the drag from wear (and the lower edges wear rapidly under constant use), the writer would recommend that both blades have steel shoes their entire length.

In order that the split-log drag may be readily operated after every rain by a single driver and one team of horses, it must be light. To this end, it should be of pine, cedar, basswood, or other light wood, and not be too long. Six or 7 ft. is ample. If this length is not sufficient to drag the road in two rounds, then narrow the road; it is evident that the road is at fault, not the drag.

A great number of earth roads throughout the Province are made too wide. A width of 18 or 20 feet from edge to edge of the ditch is in most cases ample. Twenty-four feet will accommodate a heavy amount of traffic; and only in rare instances, close to large cities, need this width be exceeded. Wide roads cost more to construct than narrow roads, and vastly more to maintain. Narrow roads, well crowned, should be the rule. A smooth, dry, well-shaped narrow road is much preferable to a wide, but rough and shapeless road; and that, as a rule, is the choice that must be made.

While using the drag, do not forget that there are other points to consider beyond the simple smoothing and crowning of the road. Drainage is of the first importance. To crown and keep a road smooth is a part of the drainage, but not all of it. The open drains at the side must have free outlets at the low points along the road as frequently as possible. When using the drag, consider the direction of the flow of water on the roads, and see what can be done to improve the open drainage.

The drainage is extremely effective, nearly as much