

White Grubs.

Editor "The Farmer's Advocate":

As I have just been looking into the white-grub question, I beg to offer the following notes on their life history:

The white grubs are the larvæ of at least two species of June beetles, viz., *Lachnosterna gibbosa*, a small variety, and *Lachnosterna dubia*, the large common one, which is over double the size of the first and less common variety.

In June, 1907, we saw immense quantities of newly-hatched grubs in our mangel patch. These grubs grew rapidly, and of course made a mess of the crop. In late October they burrowed down about 6 to 8 inches to spend the winter. In 1908 we sowed barley on the ground, and the yearling grubs got busy about the middle of May and fed on the barley till about the first of July, when they went down 6 or 8 inches to pupate, making the change in a very short time. When we plowed the stubble at the end of August, we cut a lot of them with the plow, and broke down a still larger number of their cells, in which they would have passed the winter, to emerge in the following spring.

The beetles feed on leaves in their short and busy life. They pair about the first of June, and soon after lay their eggs in decayed sod or rotten manure, completing their life history in two full years from egg to laying beetle.

Where the two varieties occur together you will find grubs of all sizes, so it would be difficult to follow them up. I was fortunate in having only the large one to deal with in the one field, so had no trouble in that way. Among our birds and wild animals I find the crow and his imitator, the crow blackbird, very useful in picking them up. The crow gets the old beetles in their hiding places during the day, and the blackbird follows the plow for the grubs.

The raccoon likes the beetles, but is not fond of the grubs, judging by the tastes of a pet coon we used to have. The skunk is fond of both beetles and grubs, and will dig for the same sometimes, but I never knew them to root over large pieces of sod.

In conclusion, I would say that there is probably a parasite or bacterial disease—or, perhaps, both—which attacks them when they become very numerous, as the young grubs are comparatively scarce now, considering the large numbers of beetles that were flying last June.

Waterloo Co., Ont.

GEO. A. SMITH.

[Note.—It is always encouraging to find our readers observing these points for themselves, and reporting the results. With reference to the matter of species, it may be noted that entomologists claim there are several species of *Lachnosterna*, all having much the same habits. The species that has been commonly credited with doing most of the damage is *Lachnosterna fusca*. It is also stated by Fletcher and other authorities that three years are required to complete the life history of the insect.—Editor.]

Simple Devices Found Useful in Drainage.

Editor "The Farmer's Advocate":

Apropos of Prof. W. H. Day's very interesting and instructive article on peep-sights for drainage-levels, it might be acceptable to your readers to know about a similar device that I have found useful during the past two seasons. A year ago this last September I tried using an ordinary level according to the instructions issued in Prof. Day's pamphlet, and experienced great difficulty in sighting along the top. Thereupon, I devised sights in the following manner: To each end of the level (mine had no brass plates on the end) I tacked pieces of galvanized iron, projecting somewhat above the top. Through one of these pieces I punched a pin-hole, about one-eighth inch above the top of the level, and measured its distance from the bottom of the level accurately. This can be done by setting the level on a straight-edge, holding a small, smooth strip of wood against the end, and marking through the hole with the point of a pin. This distance is transferred to the other end, and the galvanized iron cut off straight at exactly the same height as the pin-hole. One then sights through the pin-hole over the edge of the strip at the other end. This method is very satisfactory, but one must be careful not to make the pin-hole larger than will admit an ordinary pin, and great care should be taken to secure accuracy. With a sight such I have described one can, of course, sight only one way, but it is such a simple matter to set the level and take the reading that this is no material disadvantage. I use simply a stake with a cross-bar bolted to it, on which to set the level, and do not think it is necessary to have either buttons for holding the level on, or set-screws underneath for fine adjustment, though these, with the slot, can be no disadvantage.

As most of my ditches are curved, a stretched string would be useless for grading the ditch-bottom, besides being somewhat in the road, and necessitating the spending of a good deal of time in placing. I have used simply a light straight-

edge, with the level tied to one end of it. By working upwards, and holding one's fingers under the lower end of the straight-edge, sufficiently accurate and fairly rapid work can be done. For those whose circumstances are the same as mine, the straightedge used on the ditch-bottom is practical, simple, and efficient.

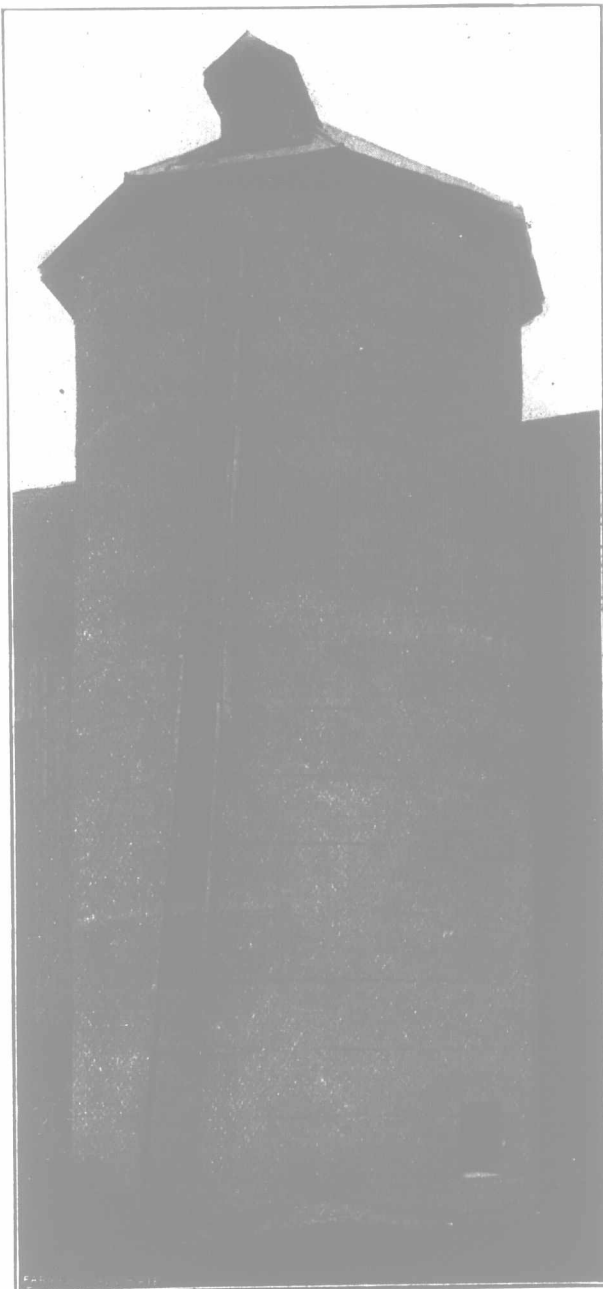
In adapting a plow for stirring the earth in the ditch-bottom, I took off the mouldboard and bolted three strips of steel (old buggy spring) in a triangular form to the three holes which are used for attaching the mouldboard—two in the plowhead, and one in the right handle. These strips hold the handle rigidly, and act, also, as a short mouldboard. Thus equipped, a plow can be used until the ditch is two feet deep. For deeper work, the handles would have to be narrowed; and for extensive operations in very hard ground it would probably pay to do this.

For extensive operations in underdraining, more elaborate methods and equipment would, doubtless, be advisable, but for those of us who have to drain merely the hollows in our fields, such devices as I have described are simple and satisfactory.

Brant Co., Ont.

The Cement Silo.

As I did not build the silo on my farm, a photograph of which you have, but bought the farm since it was built, I cannot give all particulars regarding its construction. It is 36 feet high, and 14 feet in diameter inside. Our silo has a much heavier wall than is being built within the last year or so; many of the new silos being only six inches thick, which to an old-fashioned individual looks pretty slim to stand the strain of weight and weather. I think ours is 12 inches at bottom, tapering to 9 at top. The roof is an



Round Cement Silo on Farm of F. Heal, Perth Co., Ont.

octagon metal roof, fastened to the wall by means of bolts built in the cement. The door near the bottom is in order to get the ensilage out when within three or four feet of the bottom. There is no door on the barn side of silo, below the level of the bank-barn floor, as all our mixing is done on the barn floor; so the silage has to be thrown up, and as the bottom of the silo is about two feet below the surface of the ground, it is rather hard work getting it up. I think it is, of doubtful benefit, especially for a small stock, but for our stable, which holds 90 head, it pays to load on trucks at small door and draw into barn.

Perth Co., Ont.

FRED HEAL.

Phosphorus for Prairie Soil.

Fertilizer for prairie soils is an item calculated to make Eastern farmers sit up and take notice. Yet this is precisely what is reported by a representative of "The Farmer's Advocate and Home Journal," Winnipeg, upon interviewing N. Rollins, of Balmoral, Man., who, after convincing himself by analysis that his soil needed phosphorus, used some in 1908, in the form of superphosphate (or acid phosphate), which, as our readers should know, is the most soluble and most readily available of the four forms of chemical combination in which this element may be applied. The results being satisfactory, Mr. Rollins imported from Scotland a carload of superphosphate last winter, and applied it to the soil at seeding time, at the rate of 400 pounds per acre. The soil was a rather light, sandy loam, and not deep. The fertilizer was applied with a special spreader for artificial manure immediately before sowing, and harrowed in.

The crop on the manured (fertilized) land was stronger and greener from the start. During the spring, a dry spell stopped growth of other grain badly, but the crop on the manured land kept ahead right to harvest, the straw being longer and stronger than the crop on untreated soil, the heads filled to the tip, and the kernels were larger. There was a noticeable stiffness to the straw, and the crop stood up well, though it was remarkably heavy.

RESULTS FROM USE OF SUPERPHOSPHATE ON 90 ACRES OF WHEAT.

Area in Field.	Superphosphate per acre.	Previous Crop.	Yield per acre.
Acres.	Lbs.		Bus.
10	400	Summer-fallow	39
20	400	Timothy	31
60	400	Summer-fallow	30
65		Untreated Summer-fallow	24

In addition to increasing the yield, the manuring helped the grade, the wheat grown with phosphate grading One Northern all round, and the bulk of the crop from the untreated land going only Two Northern.

The cost of the fertilizer was \$4.00 per acre. The spreader with which it was applied cost £15 4s. in Scotland, and will manure twenty acres per day.

In 1908, Mr. Rollins' experience with the superphosphate was equally as satisfactory. That wheat crop averaged 32 bushels per acre where the superphosphate was used, and 22 bushels on land untreated. This year, on the same, oats went 50 bushels per acre; while oats on unmanured soil averaged from 40 to 45. The effects of the superphosphate are noticeable in the crop for years after application.

THE DAIRY.

A Clean-milk Campaign.

Editor "The Farmer's Advocate":

Anyone who lives on or has visited an ordinary farm, must know that the milk, as generally obtained, is not clean. The cows' udders are not washed, flies in countless myriads haunt the filthy stables, while from the ceilings drop chaff, straw and dust right into the milk pails. These conditions should not exist, and can be overcome, as has been demonstrated by the Hamilton (Ont.) Milk Commission, at the farm of C. E. Webb, of Barton Township, Wentworth Co.

The unusually high death rate among infants during the summer of 1908 caused the Medical Health Officer of Hamilton much anxiety, and led him to believe it could be greatly reduced by obtaining a supply of clean milk for the children.

Although we shall tell how the work is carried on, it is not the purpose of this article to discuss children's food, but to show that all milk could be kept approximately clean with a little care. For why should anyone be compelled to take as food something literally alive with germs?

The campaign against dirt begins at the stable door, and across the entrance to this almost ideal stable of Mr. Webb's hangs a curtain of slashed sacking, which brushes the flies off the cows as they go in. The stable is light, every window open and screened. The walls, stalls and mangers are whitewashed; the cement floor absolutely clean and odorless; the gutters sprinkled with absorbent.

But in the milking is the greatest reform. The milkers wear clean white suits. The cows' udders are washed with pure water. The milk pails are not the usual kind. They are fitted with lids of but a four-inch opening, from which rises a collar an inch high. Over this collar, and secured by a rubber band, a double thickness of cheese-cloth is placed, and the cows are milked directly through this cheese-cloth strainer into the pail. As soon as full, the pails are taken from the stable and emptied. The milk is at once bottled, then cooled to a temperature of fifty degrees Fahrenheit (and kept so until delivered), to prevent the develop-