

Farm Drainage.

A sound knowledge of the fundamental principles of farm drainage is of the highest importance to the practical agriculturist. The chief necessity for land drainage is the removal of a superabundant supply of soluble salts. Too strong a solution of these salts is fatal to vegetation, and gives rise to alkali lands. A second benefit conferred by drainage is the prevention of the stagnation of soil water. A free circulation of water through the soil, carrying with it an abundant supply of free oxygen, is required by every plant. Then, drainage ventilates the soil. When ground water is lowered three or four feet, the plant roots can penetrate more deeply. By their death and decay, innumerable passages and channels are left, by which the air can enter. Again, the soil is warmed by drainage. A wet soil is colder than one that is well drained, and this is due to the cooling effect resulting from the rapid evaporation of the surface water. It is also evident that a large amount of the sun's heat is uselessly spent in drying up the damp, waterlogged soil, instead of warming the land. That a cold soil retards the germinating grain has been proved by every farmer. For ordinary farm crops, the depth to which water should be lowered by draining need seldom exceed four feet. Tiles placed 2½ to 3 feet deep will usually be found sufficient; but in cold climates tiles must be placed as deep as 3 feet to prevent their destruction by frost. On loose, loamy soil, good drainage is generally secured with drains 100 feet apart and 3½ feet deep. On heavy soil they should be closer. Drains are closed or open, according as they are covered or not. The open drain becomes easily clogged and is very unsatisfactory. In the cheap, open drain there is no economy. To drain thoroughly, the closed form, fitted with perfect joints, is absolutely essential.

WM. MACDONALD.

Tompkins Co., N. Y.

Prizes for Seed Grain Competition.

Mr. G. H. Clark, B. S. A., of the Ontario Agricultural College, has been appointed to take direct charge of the work in connection with the sum of ten thousand dollars, donated by Sir William C. Macdonald, to promote "progressive agriculture" by encouraging boys and girls to select seed grain on the farms on which they live. As has already been fully stated in the January 15th issue of the ADVOCATE, page 37, ten thousand dollars in cash is to be paid in prizes during the three years. One set of prizes is to be awarded for the largest yield per acre of oats, counting also the quality of the grain. The basis for awarding the prizes, is one mark for every pound in weight of grain of good quality per acre in the first year; two marks for every pound in weight of grain of good quality in the second year; and three marks for every pound in weight of grain of good quality in the third year. Other sets of prizes are to be awarded for wheat. Any acre of oats or wheat on the farm on which the competitor lives may be selected for 1900, and the particular acre need not be chosen until just before the grain is ready to harvest.

The competitor who obtains the largest number of marks in the total of the three years will receive the first prize in the Province; the competitor who obtains the second largest number of marks, the second prize; and so on for ten prizes in every Province.

The following show the prizes for each Province and the Northwest Territories:

	Oats.	Wheat.
1st prize	\$100	\$100
2nd "	75	75
3rd "	50	50
4th "	25	25
5th "	15	15
6th "	10	10
7th "	5	5
8th "	5	5
9th "	5	5
10th "	5	5

There will be also sets of prizes annually for the hundred heads of grain which contain the largest number of seeds of the best quality picked out of those selected from the acre each year.

Any 100 heads from the acre entered for competition may be picked; one mark will be awarded for every seed on the 100 heads, and two marks for every grain (in weight) which those seeds weigh.

The competitor who receives the largest number of marks will receive the first prize in the Province; the competitor who obtains the second largest number of marks, the second prize; and so on for the ten prizes in every Province.

The following show the prizes for each Province and the N. W. T. for 1900, 1901 and 1902:

	Oats.	Wheat.
1st prize	\$25	\$25
2nd "	20	20
3rd "	15	15
4th "	12	12
5th "	10	10
6th "	8	8
7th "	5	5
8th "	5	5
9th "	5	5
10th "	5	5

The seed grain for this competition is not supplied, and it is not necessary to choose any particular variety of seed for sowing this year, but whatever variety of seed is sown this year will be continued during the three years of the competition on each farm.

Teachers in rural districts are invited to join in

helping to forward this educational movement. Any teacher may send in a list of not more than six pupils in the school district for competition.

All those who desire to enter the competition should send their names and addresses to Professor Robertson, Ottawa, before the 1st June, 1900. These communications should contain only the words "Entry for seed grain competition," and the full name and address. They will be carried by mail free of postage.

It is particularly requested that no questions be asked on these entry applications. Full particulars will be mailed in good time to every one whose entry is received.

It will not be necessary for any of the boys or girls entering this competition to receive any further directions concerning this movement until some time in June, when full particulars will be sent to each competitor, intimating how to choose the particular acre and how to go about selecting the large heads from it for seed grain for sowing next year.

Corn Planting and its Early Cultivation.

Probably no other crop grown in Canada has shown greater improvement in yields and increase in acreage during the last few years than has corn. Where, a few years ago, a farmer grew probably three or four acres of Indian corn to husk for finishing his hogs in the fall, he now grows three or four times that area, to supply feed for his cows and young stock as well as his hogs. Years ago we heard of the immense yields of corn produced in the Western States, and believed the land out there was so adapted to that crop that we could not hope to approach them in yields. We now know that by selection of varieties and proper cultivation some of our farmers can make as good showing as can Western hog and steer farmers, who depend largely on corn for the support of their stock.

We find in Ohio, Iowa, Wisconsin, and other corn States, as well as in our own country, hill planters and drill planters about equally divided. Probably this question will never be settled, from the fact that there are so many diverse circumstances attending the general corn crop, owing mainly to the different dispositions of farmers and their ideas of handling the land. The aim of the careful corn-grower is to prepare the ground and plant the seed in such a manner as to admit of cultivation that is of most benefit to the growing crop and at the same time most convenient for himself and team. He also aims to distribute the seed so as to render the plant food in the soil of easy access to the plant, and always to secure the largest yield. While Ohio Experiment Station found in three years' experiments that corn drilled or step-dropped gave better returns than when planted in hills, the question is not thus settled for every farmer, as those who cannot attend regularly to cultivation, or who have the habit of doing thing in a slipshod manner, should plant in hills well apart each way, so that a sharp deep cultivator can be run either way to destroy the weeds without disturbing the corn plants. This is not the best manner of cultivating the crop even in hills, as careful, timely and thorough work will pay as well here as under any other circumstances; but the point we wish to make is that hill corn can be kept clean with less labor, and especially if a wet spell or busy time comes on, when it is difficult to drop everything else and attend to cultivation. If weeds once get the start in drilled corn, it is a difficult task to subdue them; while with the corn in hills it is possible to get on all sides of the weeds and with the horse hoe gradually exterminate them. Where one can manage his work so as to attend to the corn crop when it demands it, drilling is probably the preferable way to plant. Drill-planted corn will not suffer so much from a portion of the seed failing to come up, or a portion of the crop being pulled up by birds.

Corn for either silo or husking must be grown wide apart, in order to get a maximum of well-developed ears. In hills, three and one-half feet apart is not too wide, with an average of five to six kernels in each hill. In drills, the same width apart is not too far, with a stalk every fourteen inches. It is important to have the ground in fine condition to receive the seed, and after the seed is in, the harrow and roller should be used to compress the soil about the seed so as to insure quick germination. Harrowing before the plants are up and several times after, even until the corn is well up, is growing in favor. This is especially important after a heavy rain, which would cause a crust to be formed, as such a crust would delay, if not prevent, the young plants from coming through. Breaking the crust also preserves moisture, which is very important, as experiments have proven that it requires 300 pounds of water to produce one pound of dry matter in a corn crop. Nor is this the only advantage of repeated harrowings, as the numberless weeds that will be destroyed just as they are germinating will far more than repay the labor demanded. So that by keeping the harrow going occasionally from the time the corn is planted, we provide more plant food, provide the moisture to dissolve the plant food, and we destroy weeds in their weakest stage, when it is most easily and effectually done. It may be well to delay harrowing just while the corn plants are appearing, as then they are very tender, but in a few days a light harrow or weeder will do no harm, but much good to the crop. But if there has been a rainfall, and there is danger of the land baking and crusting, it will be better to start the harrows as soon as the ground is dry enough to bear the horses and work satisfactorily.

When the harrow has to stop and the cultivator commences, the latter may be run rather deeply at first before the roots of the plants have extended far from the rows, but as the season advances the roots will form a network throughout the soil, and to trim them off will, so far as it is done, destroy feeders that are gathering the food for the growing crop. It is therefore in the interest of the crop to run the cultivator probably four or five inches deep at the commencement, reduced to two inches deep when the crop is two feet high.

Cutting Straw from Thresher.

To the Editor FARMER'S ADVOCATE:

SIR,—I noticed in the ADVOCATE of April 16th a letter from D. W. Gingrich, entitled "A New Machine Wanted." I differ from him in his suggestion of putting a cutter in front of the thresher, as it is almost impossible to keep a large quantity of the cut straw from going into the grain. A much simpler and cheaper plan is to use the large-sized "Blower" cutting box, 14-in. throat and self-feeder, placed at the end of the long rakers. This machine will cut all the straw (after threshed) that an ordinary thresher will take through, and will mow the straw without any labor. Of course, an extra engine is required on the opposite side of the barn to run the cutting box. I cut all my straw last year with a Wilkinson "Climax A." Two men were required to pack the straw on the self-feeding table by merely patting down the straw with the hands. The blower delivered it at the peak of the barn, 38 feet, and when it was getting crowded the elbow of the pipe was changed a little so as to deliver it in another direction. The cost per day for taking care of the straw was: Engine and man, \$2.50; two men, \$2; total, \$4.50. It would have required seven men to have taken care of the uncut straw (and it would be still uncut), and the barn would not have held it. I agree with Mr. G. on the benefit of having the straw cut for feed, but there is another great benefit, and that is in the bedding. The cut straw will soak up all the liquid manure. My stables are water-tight, and when we used the long straw we had to take up the liquid and put it on the load with a scoop shovel. Much of it drained out before it got to the large heaps in the field, where it was left in the winter. In the case of the manure when we use the cut straw, it is all absorbed and drawn to the field and spread at once, where it is required. A good cultivator, spade or disk harrow will readily mix it with the surface soil, and the work is done, and done in the winter when there is plenty of time to do it, and not left till spring when there is a rush. JOS. E. GOULD.

Ontario Co., Ont.

Masonry Arch Under Approach to Barn.

Where basement barns are built on the level, it is now customary to occupy the space beneath the approach or driveway into barn with a box stall or root house. A difficulty met with has been to get a satisfactory roof or covering to the stall—one that will shed water and not soon decay. Mr. R. A. Penhale, of Elgin Co., Ont., during a call at our office described a plan that has been found quite satisfactory in his neighborhood. It is to construct an arch of brick parallel with the side of the barn and as wide as desired, usually about 9 feet. The arch forms a half circle built of bricks trimmed wedge shape and set on end. It is constructed similar to an arch over a stream beneath a railroad or other like situation. It is necessary to use a wooden arch to build the bricks on, which can be removed as soon as the mortar becomes firm. The doors from the basement into the stall or root house are also arched in the same manner. When commencing to construct the arch, a ledge about six or eight inches wide should be built up outside the wall of the basement, as high as where the arch commences, on which one side of the arch rests. This will require to be guided by the height of the barn floor from the basement level. The other side and ends are built up in the same manner, but of heavier wall. An arch 9 feet wide should be commenced five feet six inches below the barn floor. This allows for a rise of four and a half feet for the arch—being half its width—and one foot for soil above the arch. In the center of the top a large sewer pipe can be inserted to receive the roots, and windows can be placed in the ends, as desired.

The Barberry Shrub Must Go.

Since it has been discovered by scientists at the Ontario Agricultural College farm and other institutions of agricultural investigation that the barberry shrub serves as a host plant in the life-history of rusts of wheat and other cereals, considerable agitation has arisen as to the best means of preserving our crops from rust from this source. We believe Mr. Rennie, Supt. of the College farm, had all barberry hedges and plants destroyed on that farm some years ago, and now it transpires that others will be required to treat this dangerous shrub in the same way. To this end an Act introduced into the Ontario Legislature by W. H. Taylor, member for North Middlesex, has passed its second reading. The Act provides that no person shall plant the shrub known as the barberry shrub upon any lands used for farming purposes in the Province of Ontario, nor upon any land situated within one hundred yards of any lands used for farming purposes, and every person guilty of the violation of this section shall be liable to a penalty not exceeding \$10, besides the costs of conviction.