whole it is for the best, although we can well see that in some cases where the land is specially in need of cleaning from noxious weeds, the fallow may be used to advantage, but it may also be made to include a system of green manuring by plowing down some crop which will increase the fertility of the land and make a good preparation for wheat and also for the grass which is supposed to follow it. Clover sod, or even timothy sod, plowed soon after a crop of hay has been taken off, or where it has been pastured, makes a good preparation for wheat if it is rolled immediately after plowing and the surface cultivation has been such as to solidify the land and at the same time keep it in a moist condition. Wheat may follow peas to good advantage when the latter have been sown on inverted sod; and if the land is reasonably clear of thistles, it is usually unnecessary to plow for wheat if thorough surface cultivation is given. Peas gather nitrogen from the atmosphere and store it in the nodules near their roots, and when harvested with a mower these are left on the land for the use of the succeeding crop, and thus prove doubly useful. If wheat is to follow barley or oats, it is essential that the land be rich and the cultivation such as to well pulverize the soil to the depth of the plowing; and if not rich, a top dressing of short manure should be worked into the surface by means of harrow and cultivator, to furnish the necessary nourishment for the wheat crop and the clover to follow. It seems to be essential in late years that seeding of wheat should not be later than the first week in September for Ontario conditions in order to good results. As to varieties, it is best to sow what has given most general satisfaction in your section after a fair trial, and to adopt new varieties only on a small scale until fairly tested. Wheat is such a clean and pleasant crop to handle we do not wonder at the favor it receives from so many farmers; and where the soil and conditions are favorable for its growth, it may well fill a place in the rotation of crops in many sections of Canada profitably, but do not sow more acres than you can properly prepare, and do not sow on land from which you have not good reason to expect a fair crop. In this connection the timely letters of several of our readers on this subject will repay perusal.

Central Experimental Farm Methods in Winter Wheat Growing.

To the Editor FARMER'S ADVOCATE:

SIR,—Fall wheat is scarcely ever grown by farmers in this district. On the Exp. Farm we have been experimenting with the leading varieties and hybrids, and they have generally done well, but the past season every plot was winter-killed. During the autumn of 1896 there was a very long and severe spell of cold, freezing weather before any snow came, which was partly the cause of our failure, and what was not killed by frost was smothered later by snow.

Fall wheat should follow either meadow or pea land.

Implements.—Gang Plow, disk harrow, smoothing harrows, and seed drill.

Preparation of the soil.—Meadow. Gang plow very shallow as soon as the hay is off, disk harrow and harrow with smoothing harrows thoroughly so as to cut all the sod and kill any weeds that may germinate, and keep up this cultivation at intervals until the last week in August, then plow eight inches deep and harrow thoroughly before sowing. On pea land use the cultivator and harrow instead of the gang plow and disk harrow up to the time of sowing, then plow before sowing.

Manure.—If I have any well-rotted I apply fifteen tons per acre on light land; on heavy clay, well drained, I have had excellent results from plowing under pure straw. I do not use green manure nor commercial fertilizer for fall wheat.

Dates for sowing.—The last week in August or first week in September.

Quantity.—One and one half bushels per acre.

Varieties.—I am sending you the results of 1894 and 1895, there being no report on wheat, 1896.

Soil.—I would prefer sandy loam, but I have had good crops off clay loam well drain.

J. FIXTER, Farm Foreman,
Carleton Co., Ont. Central Exp. Farm.

[NOTE.—In 1896, Dawson's Golden Chaff topped the list, with a yield of 45 bush. 20 lbs. per acre (61 lbs. to the bush.); Hungarian, 44 bush. (64¼ lbs.); Genesee Giant, 43 bush. (61 lbs.); Democrat, 42 bush. (63½ lbs.); Bailey, 41 bush. 20 lbs. (61¼ lbs.); Manchester with Democrat, 40 bush. 40 lbs. (64 lbs.); Early White Leader, 38 bush. (59 lbs.); Jones' Winter Fyfe, 36 bush 40 lbs. (62¼ lbs.); American Bronze, 36 bush. 40 lbs. (60¾ lbs.); Golden Grass, 34 bush. 40 lbs. (63¾ lbs.); Manchester alone, 33 bush. 20 lbs. (62 lbs.); Early Red Clawson, 33 bush. (61¼ lbs.); Surprise, 30 bush. 40 lbs. (60½ lbs.).—ED]

Winter Wheat Culture -- Methods and Varieties.

To the Editor FARMER'S ADVOCATE:

SIR,—The fall wheat crop has done exceptionally well under almost all conditions this year. The principal causes of failure noticeable are lack of drainage, want of care in the preparation of the soil, and a deficiency of plant food to nourish the growing and tender plant. To get the best conditions for autumn growth of wheat should be the constant aim of the successful wheat grower. A good rich sod land will, I think, be found the best. Whether it is pasture, meadow or alsike stubble makes very little difference, but if you can get a good sward of grass to plow down, so much the better. In my own practice I like to plow a good furrow with a medium wide plow, about eight inches deep, and then without harrowing haul and spread evenly from eight to twelve loads of farmyard manure per acre, then work it well into the surface soil with whatever implement will do the work best. Sometimes the gang plow is needed, in many cases you can do it well with a disk or acme harrow, usually so if your manure has been turned and well decomposed before putting it out, then roll thoroughly and sow about six or eight pecks per acre of perfectly clean seed. If you have any symptoms of smut, don't fail to wash your seed with the copper sulphate solution. About the first week of September I regard as the best time to sow, but seasons may vary this a little, but I regard it as being quite risky to sow after September 10th.

In varieties I have had very little experience. For the last year or two have been growing Dawson's Golden Chaff as a general crop and have reason to be pleased with it; but I think it is losing its identity somewhat, and soon it will be difficult to distinguish it from the old Clawson, from which I believe it orginated. Democrat is pretty generally sown here and is considered a better wheat than Golden Chaff for light soils, growing a heavier straw, but it is noticeable that it is not standing up as well under the heavy rains that we have had recently as Golden Chaff. Golden Cross has been grown here to some extent and yields well under very favorable conditions, but is not regarded as being very hardy. Early Genesee is being tried in small quantities this year, and in most instances is quite promising, although from my own observation I would hardly like to pronounce it an improvement on the older sorts. Our soil here is rather a light loam than otherwise, but in some places we have quite heavy land on the same farm that we have the light soil, but both kinds, with proper cultivation, seem to reward the desire of the husbandman. JOHN BURNS.

Perth Co., Ont.

Good Drainage the Key to Wheat Growing.

To the Editor FARMER'S ADVOCATE:

SIR,—Our crop of wheat this season is exceptionally fine. I don't think we ever had a better. It is splendid this season wherever it was sown on loamy, well-drained land, but in some localities where the land was clay and badly drained it was plowed up or is a failure.

We prefer to sow wheat after beans, as the soil is in the best possible condition for wheat, if the beans have been properly cultivated. We simply cultivate or gang plow the land after the beans are harvested and drill in the wheat. Usually the land is heavily manured in the spring for the beans. This insures a splendid crop of beans and a good crop of wheat. Have had no experience with commercial fertilizer.

Date of sowing.—From the 1st to the 20th of September. We prefer to sow nearer the former than the latter date.

Seed.—From 1 to 1½ bushels per acre, according to the strength of the land. We usually sow 1¼ bushels per acre.

We have three varieties this year, viz., Dawson's Golden Chaff, Genesee Giant, and McGarvin wheat. The latter is of local origin and a very heavy yielder of high-testing wheat. I think this season's crop shows clearly that good drainage is the main key to successful wheat growing.

Kent Co., Ont. W. A. MCGEACHY.

Seasonable Farm Work.

In some sections of the country rains have fallen so frequently and copiously as to delay harvesting, and it is often difficult to decide just what work it is best to undertake in the interval while the harvest fields are drying. If winter wheat is to be sown, there is no work that can be done to better advantage at such times than plowing for wheat, and the advantage that may be taken by prompt action at such times can hardly be overestimated. For a few days after a good soaking rain the land is moist to the bottom of the plowing, and the draft on the team is light compared with what it would be when the land is dried out. The weather is likely to be cooler for a few days after a heavy rain, and this will also be favorable for the teams, so that the plowing can be pushed on rapidly. The roller and harrows should follow immediately after each day's plowing. If this is delayed for a few days the land will become dry and hard, and will require much more labor to make it fine, and the moisture will have evaporated and will be lost, while it might have been retained if the work of harrowing had been promptly attended to. If the land has been plowed some time and not harrowed, advantage should be taken of the circumstance of a good rain to reduce the surface of the soil to a fine tilth immediately after by the use of the harrow. It is also important that the seed be sown soon after a good rain. Then the ground is moist and everything favorable for the sprouting and the vigorous growth of the young plant. Much depends upon a good start. It may make all the difference between success and failure. The writer last year sowed a crop of wheat on ground that had just enough moisture to sprout the seed, but not enough to keep it growing vigorously. About half the plants died and the remainder made feeble growth. The result is half a crop, and that on ground rich enough to have produced a full crop had the conditions been favorable. If we had our way no seed should be sown just before a heavy rain. It may be merely a notion, but we have always thought that a crop sown then did not make the healthy, vigorous growth that it does when sown just after a good rain. The conditions necessary to the healthy growth of plants are air, moisture, and warmth. If the ground is packed and crusted by a heavy rain just after sowing the air is excluded from the roots of the plants and they become bound and restricted in their growth. The packed surface also allows the moisture to become evaporated rapidly. On the other hand the drilling or working in of the seed after a rain is as good as one cultivation and the plants are left free to grow, the surface being prevented from crusting, evaporation checked, and moisture retained. We are fully persuaded that good results will follow harrowing the wheat after a rain which has packed the ground, even if the wheat has sprouted or is up above the surface. It will be found to relieve the plants and promote their growth, loosening the soil and retaining the moisture.

Homemade Lightning Rod.

To the Editor FARMER'S ADVOCATE:

SIR,—I have lately made and put up a lightning rod and would like to tell you about it, as it may be of interest to some of the numerous readers of your paper.

The rod made.—The rod was made of nine strands of No. 8 galvanized wire twisted together. For each length of rod that was needed the wire was measured and cut. Then each wire was bent at one end hooked on to the short crank of a grindstone and made fast. At the other end each wire was put through a separate hole in a short piece of board, pulled evenly tight and bent to keep from being pulled back. Then one turned the grindstone and the other held the board and in a very few minutes it was twisted firm.

Ground connection.—By means of a two-inch well auger a hole was bored eight feet deep into wet quicksand and the rod put down to the bottom.

Attachment to building.—Three-cornered cedar blocks about three inches across were nailed to the building and to these in a notch across the center the rod was nailed. A sufficient number of blocks were used to keep the rod from touching the building. Each rod was brought in as straight a course as possible to the ground.

Points.—The points are on the ridge of the barn, are about 20 feet apart and 10 feet high. To get the height, light cedar poles 6 feet long were set up perpendicularly and stayed with wire, to these the rod was fastened. Each point (except one which was spliced to the rod leading from another point) has separate ground connection. At the actual point the three center wires are left a little longer than the others and point straight up, the other six are bent outwards at a slight angle.

Labor, weight, and cost.—It took two of us (green hands) a little less than a day and a half to make and put up 240 feet of rod. Per foot it weighs 1/16 of a pound, and cost for wire 1⅛ cents.

Middlesex Co., Ont. THOMAS BATY.

NOTE.—We have submitted the above description to a couple of men who have made a study of this special subject, asking them to indicate any points wherein the plan might seem inefficient, or to offer suggestions whereby it might be improved, and we append their replies. Owing to the frequency with which buildings are destroyed by lightning, the generally recognized value of properly constructed rods, and the extortions practised by many so-called "lightning rod men," the subject is very important, and any additional light which other readers can give will be welcomed.—EDITOR.

"The first thing that strikes me on reading this is that the insulation is imperfectly provided. Why might the rod not as well be stapled to the barn as to the cedar blocks. The frequency with which currents are reported to follow the eavestrough and conductors would lead to the belief that Mr. Baty's wire conductor would lead off light discharges without insulation, but I do not think his method of attachment commendable.

"In comparing the efficiency of this with the rods on market the relative conductivity of iron wire and copper or amalgam rods is an important question.

"The *points* as constructed may be fairly effective. I should think proper platinum or steel points could be wired into the cable at the ends so as to make connection. These could be added to the wire points. Of course this rod is very cheap. If it is not capable of doing much work, it cannot, I think, so long as it has ground connection with wet quicksand, be a source of danger.

"London, Ont. JOHN DEARNESS, I. P. S."

DEAR SIR,—Your letter of July 2, referring to a note sent to Mr. McAdie regarding a homemade form of lightning rod, has received attention in this office. The twisted wires make up a rod having much more *superficial area* than any solid rod of same weight per foot. This is a distinct advantage, because in the very rapid oscillations attending a discharge of lightning the induction is practically confined to the surface, penetrating only a fraction of a millimetre, and hence solid rods are of much less value than ribbons or a bundle of wire. The insulation, or cedar blocks, only strikes us as insufficient to stand the strain of induction, and this should not be allowed. WILLIS T. MOORE,
Chief of Weather Bureau.

U.S. Department of Agriculture, Washington, D.C.
July 15th, 1897.