

restricted than formerly: he is more at liberty to choose his crops with reference to his markets, thus tending to make his business more remunerative. Their importance cannot be over-estimated as long as farmers allow so large a proportion of home fertilizers to waste, and as long as the sewage question of the cities remain unsolved. Leaving the improvements of farm implements out of consideration, we can safely assert that the attainment of better results in farm operations is mainly due to a knowledge of the relations of the plants to the soil, air and water, and the various relations of these three agencies to each other, besides a due appreciation of the mutual dependence of plant and animal life. The new agriculture recognizes as its basis the necessity of a strict restitution to the soil of those substances which the crops have abstracted. There is no opposition to any particular system; each farmer is left to choose the kind of farming best adapted to his natural and personal resources, yet all are restricted by one common rule—they have to comply with the unalterable relation between demand and supply, for sooner or later every crop, in its own peculiar way, tends to exhaust the soil.—*New York Herald.*

Ploughing Twice for Wheat.

When wheat is to follow where wheat was raised the past season, the question of ploughing twice is scarcely an open one, for if not ploughed soon after the crop was harvested, the ground becomes so hard as to render proper preparation almost impossible, but when wheat is to follow oats the question is an open one, and takes a much wider range. If the ground could be properly ploughed but once, and that just in time for seeding, we could produce as good crops as by ploughing twice, but there are two evils, and one or the other (or both combined) will come in the way of this. If the ground becomes hard and dry, as it does in eight seasons out of ten, it cannot be properly ploughed, and the work of after preparation is more than doubled; if, on the other hand, the season has been wet, the growth of weeds is so great by the last of August that they cannot be turned under, and very rough work is the result at best. If ploughed twice in the usual manner, the upturned soil very much increases the labor and expense of carting out the manure, by forcing us to carry much smaller loads. In trying to obviate and steer clear of as many of these evils as possible, I have this season tried a plan which seems to be a kind of combination of the two. As soon as the oats were cut off, a plat of six acres was manured in the usual manner, and at once turred under by a good furrow. After this, the remainder of the field was manured, and its ploughing finished by August 20th. On the first plat the shatterings of the oats were three inches high, and in some places the plat looked quite green. August 22nd, the plough was again started in the first plat, and followed by a heavy roller. As a result, we do not find much more manure on the surface than on the plat ploughed but once, and that the reploughed plat does not require one-fourth as much harrowing as the one ploughed but once. What the future result may be I do not know, but from previous experiments in this line, I expect a favourable one in the grass, without much if any show in the grain, but shall be able to report in due time. Can any of your correspondents give us any light as to the proper depth to drill wheat? I have known good crops to result from the seed ploughed in to a depth of four inches, and equally good from its only being covered by one harrowing. Another question: If no spots are missed by the first harrowing, does a second stroke cover any more seed, or does it uncover as much as it covers?—*Cor. Country Gentleman.*

Plaster and White Clover.

A correspondent writes to the *Country Gentleman* that he has been lately inspecting a farm devoted to the natural grasses and to white clover, as the land is hilly and the soil is a yellow clay loam, a sort of light drift, with a capacity for producing below the average. Though cleared of timber for seven or eight years, it has never been ploughed. He says:

"Two years ago the land changed owners. The present proprietor, Jacob C. Nellis, of Fort Plain, proposing to continue the land in grass, sowed it with plaster. He applied about 150 pounds per acre. There was a decided improvement in the feed, principally white clover. What is interesting is the effect of the plaster on this creeping trefoil. You could not only see distinctly where the plaster had missed, but the difference was all difference. The plaster brought out a thick set of the clover, and the missed places had for the most part no clover at all, and little else. This lot had the cows on it during the time it afforded pasture till three weeks ago, or the latter part of May, when the cows were turned out and plaster was sown. The chief effect was produced the last eight or ten days, when the white clover, as by miracle, seemed to

have been drawn out of the ground. This was aided by a couple of rains. But what surprised me most was about an acre of ground which had had potatoes grown on it when it came into Mr. Nellis' possession. Whether the ground had been manured or not Mr. Nellis does not know. But not being able from a crowd of work to plant it, he left it in the condition he found it. It produced some grass and weeds, which were helped by plaster. The plaster was renewed this spring in a good dressing, which started at once into life a crowd of white clover, the equal of which I have never seen. It is but three weeks since the stock was turned out and the sulphate applied, and the growth now is as thick a stand as it is possible to be, and over ankle high, the ground a net work of roots and vines

Winter Oats.

An inquiry having been made about winter oats, I will give my experience, which has been mostly with the variety known here as the "Henderson" winter oats. They grow very slowly in the fall, taking deep root, and never jointing before winter, even when sown in July or August. They do not cover the ground as well as wheat in the fall and winter, but have longer leaves and make more pasture. The leaves and roots stand frost as well or better than wheat. They do not joint as early by two weeks in spring as wheat does, and while wheat is jointing they are stooling out or tillering, until they get as thick as the land will bear, so that at harvest they are all right. We have found them generally improved by cold winters, making heavier grain and longer heads. This year the longest head I saw measured 27 inches in length, and the clean grain weighed 46 pounds to the level bushel

They have only three or four joints to a stalk, and these are near the ground. It is sometimes five feet from the upper joint to the top of the head. I do not think that 40° below zero will kill them, unless the ground is too wet; is covered with ice. They have stood well 16° below zero here, and occasionally a few degrees below that, nearly every winter. They have been sent out this fall for nearly all the Northern States for the first time. The Agricultural Department has this fall distributed some mixed winter oats under some name, and as part of the mixture is Henderson winter oats, it may do for a test. If we get reports next summer from all recipients who have tried these and other samples that have been sent out from here this fall, the question will be approximately settled. All true winter oats are rust proof, and remain so until they have been sown too often in spring. The longer they have been sown in fall the better, even for spring sowing. They take deeper root than spring oats, and do not suffer at all from dry weather before harvest. The later the winter oats are in maturing the better they stand the winter, and the same is true with wheat.—*Cor. Country Gentleman.*

The Drill and its Economy

A correspondent of the *Ohio Farmer* has been examining the question of whether a wheat drill pays or not, and he says:

"Nearly every man acknowledges the advantages claimed for drilling, but they do not generally exercise a 'living faith' in it—a faith that will compel them to buy the first good drill they come across. In my section as far as I have been able to ascertain, only one farmer in five owns a drill. The other four sow broadcast or borrow of their neighbors. One is about as reprehensible as the other, and either indicates bad management, ignorance, or stinginess. I class them under these three heads, for the objections I meet are 'not able to buy,' 'don't believe they pay,' and 'too high-priced.'

"When a man tells me he is not able to buy a drill, I give him this illustration:—Mr. A. puts in ten acres of wheat every year. Three years ago he bought a drill of me. Before that he sowed two and a half bushels to the acre; since, he has used but one bushel and a half per acre. Thus, in three years he has saved on seed alone, thirty bushels; calling it \$1 per bushel, a very moderate estimate, he has saved \$30. He has secured a much better yield by drilling. The first year he drilled wheat, he puts his gain over broadcasts owing at 25 bushels; the second year, 30 bushels, and this year, 10 bushels. He gets these figures by comparing his present crops with past ones, and with his neighbor's crops that were sown broadcast. Here is a gain in three years of \$65. Adding this to the \$30 saved in seed, and we have \$95 gain in three years—\$15 more than the drill cost him, and it is good for twenty years' work. Don't that pay?"

"O yes," says one, "to hear you tell it; but the drill don't save that much seed, and don't increase the crop very much." Very well, but I say it does. It will save one-third of the seed every time, and produce ten to twenty per cent. three seasons out of four. In a very favourable season, especially with a very favourable winter, the difference in yield is not so great, though it is large enough most any year to pay a good interest on the money invested in a drill. In the case I have cited, the average yield for five years by broadcast sowing was fifteen bushels. For the three years of drilling the average yield was nearly eighteen and a half bushels. But the crop of '74 was an exceptional one, and the average yield of fields in this section was greatly increased over previous years, or the two years since.

"There are several good reasons why drilling produces better crops than sowing broadcast. The seeds are deposited at the same depth, and at the right depth, are covered uniformly, and with fresh, moist earth, thus securing early germination and uniform development. Very much is lost by the unequal ripening of wheat in broadcast sowing. This unequal development, I have no doubt, is the cause of many of the diseases of wheat, as the plants retarded by deep sowing are weak and feeble, unable to resist the bad influences of weather, etc., and are the very ones to invite the attacks of insects. In drilling the seeds are placed at uniform distances apart in the rows. In broadcast sowing, two, three, four and more grains will frequently fall together. These crowd each other, and part must perish, or else all are only partly developed. In compact soils wheat should not be covered more than two inches, nor less than that; in light or loose soil, three inches is about the right depth. Two shallow is worse, if possible, than too deep, as there is not as regular a supply of moisture to the shallow covered grains."

Salt as a Fertilizer.

I beg leave to say a few words in regard to the use of salt. I fully endorse the statement made by your learned correspondent, S. Rufus Mason, in the use of salt to kill worms and insects. Lime also has considerable effect in destroying insects, thus at once preventing their depredations and fertilizing the soil by their remains. Lime is used to a great extent in many parts of England, especially upon strong land; and where it is used liberally the land is not infested with grubs, worms, etc. It is true that a great many farmers are afraid that salt will kill vegetation; but this is an absurd idea if used in proper quantity. Salt as a manure is singularly beneficial, if used in small quantity. The fattening of cattle upon salt marshes has been practiced time out of mind, and it is the salt contained in those lands that a very considerable part of the effect must be attributed. Salt is of great use for raising turnips and other roots, and also for all sorts of grain, causing the straw to be strong and the grain thin-hulled and heavy; at the same time it destroys noxious insects.

There was a time when the quantity of salt recommended was from twelve to sixteen bushels to the acre; but on the authority of a gentleman who had made, through a course of years, a great number of experiments in the use of salt as a manure, and who communicated the result of them to Parkes, the ingenious author of the "Chemical Catechism"—one bushel per acre is all that can be used with safety, a greater quantity would render the land sterile for two or three years afterwards. This is consonant with the fact that a small quantity of salt hastens putrefaction, while a large quantity effectually prevents it; for the salt does not act so much by its being absorbed by the plant, as by its property of attracting moisture from the atmosphere, thus promoting the decomposition of other substances and causing them to afford the nutriment required.

A Mr. Cartwright received from the Board of Agriculture the honorary reward of a gold medal for a valuable set of experiments made by him, to ascertain the value of salt in agriculture. Of the soil he used nearly three-fourths was sand, the remainder consisted of calcareous and vegetable matter, with alumina and a small quantity of oxide of iron: Having tried all the usual manures alone and differently combined, he found salt to be superior to any of them when used singly, excepting chandler's groves; but of mixed manures salt and soot were superior to all others. The produce upon which these experiments were made was potatoes, and it was observed that wherever salt was used this root was free from scabiness, with which it is commonly infected. One peck of soot and a quarter of a peck of salt were used to a bed one yard wide and forty yards long. When the salt was used alone the quantity was the same to a bed of the same extent. Chandler's groves, it has been noted above, is an excellent manure, proving superior to salt when used alone. The refuse of salt-works, soap-boilers' and bleachers' wastes may also afford the farmer an equally valuable resource.—*Cor. Germaniston Telegraph.*