

his industries. Let this be called brain-farming, book-farming, or what it may, it is really mathematical farming—the use of the pencil with the plough. Before any project is entered into, it is well to count the cost, and figure out the probable results. It is an easy matter for a dairyman near a cheese factory to see that every calf raised upon his farm, at the expense of two gallons of milk per day, costs him at the end of the first three months at least twice the weight of the animal, unless, perhaps, it be one of uncommon promise and blood. Yet all dairymen do not realize it. It is equally evident that the keeping of two fully developed work-horses perpetually upon a farm, where not more than ten days' labor with a team is required in a year, is incurring a risk and heavy expense, and, of course, a loss; yet it is practised by thousands. I might enumerate cases of this kind to almost any extent, but the object is simply to show the necessity of more thorough investigation in all minor, as well as prominent points, in the pursuit of farming.

A majority of the farms throughout the country are not paying three per cent. annually on their estimated values, and still these farms are year after year kept under the same routine of management. A low per cent. is returned by tillage, when higher could be obtained by grazing; others give a meagre income by grazing when tillage would pay bountifully. Others are used for mixed farming when especially adapted to some certain brands. Mixed farming, in the broad sense of the term, is adapted to but few localities, and there is wisdom in the arrangement. One branch of husbandry well followed makes efficiency in that line, and the interchange of products facilitates the growth of enterprise, and gives a healthy tone to all departments of home industry. Then the first thing which farmers should do is to determine by experiment to what their lands are best adapted, taking nature of soil, convenience to market, &c., into consideration, and then make the particular line or lines the leading feature of their avocation, regardless of their particular tastes respecting the different branches. Because this matter is not thoroughly settled may be attributed very many of the failures in farming.

A continuous shifting without taking notes of results is as unprofitable, and perhaps more so, as sticking to an unremunerative line. Some men are always moving by the influence of a fluctuating market, as the mercury in a thermometer by the influence of the temperature. It would take a sudden turn upward, there is a headlong plunge for sheep, high prices paid, and dairy cows sold at a sacrifice, and vice versa. It requires a number of years to get well established in any line of husbandry. If in dairy or wool-growing, the herds and flocks must be sorted and re-sorted before either is brought up to a proper standard of excellence, and the sacrifice of frequent changes is more than generally realized.

Another very great defect in agricultural pursuits is the very general habit of always being behind the work. It must be evident to every one that the man who begins early to make selections for spring sowing, getting those seeds which are best adapted to his soil and latitude, and those which will yield the greatest return per acre, will succeed better than he who delays all this, and makes no effort to secure them until the soil has been fully prepared. In the latter case, ten chances to one if poor seed is not finally used, and meagre returns made.

Some farmers complain that they are always behind with their work on account of not being forehanded enough to carry on their premises independently; that they have to help their neighbors in seed time and harvest before attending to their own farm interest, in order to procure funds and help to do their work with. Now, the man who gets into this rut is destined to remain there just so long as he has not resolution enough to extricate himself by a change of practice. Than to live in such a condition

of servitude and self-robbery, he had better pay four times the real value of seed tools and help, and mortgage to do it, and then keep fully up to time. Here and there all over the country, let the season be what it may, will be found every summer inferior fields of grain, the result of bad seed or late sowing, and spindling corn from late planting. In winter will be found upon these farms poor stock, because fed upon hay which was not cut until it had lost nearly all of its nutritious element. The loss attending such management as this one year should be a lesson to the one who suffers by it, but it is not, for, as before stated, he thinks that his circumstances will not allow of a different course. The husbandman who is always behind time in his farm operations is, in addition to the inconveniences alluded to, subject to the tricks of sharpers in the commercial world. As soon as any article of produce is marketable it must, through the ever-pressing demand for money, be sold, its prices range as they may, and this subjugation of a class has an effect more detrimental upon the produce market than any other influence brought to bear upon it. So a whole community is affected by the inadvertency of a class.

### How and When to Sow Clover.

F. P. Root, of Sweden, N.Y., writes on this subject to the *Rural Home*, as follows:—Experience has taught me that seeding on spring grain is very unreliable. The season is too far advanced before spring grains can be sown to make clover seeding safe, and on lands where winter grain can be grown I would never attempt seeding on any other. Early sowing has proved most successful, and has seldom failed where the land has been in good condition. Exhausted soils and lands not well tilled cannot be relied upon with safety, neither is a clover lay turned under and sown to winter grain as good for seeding as when other crops have intervened. The best preparation for seeding is when winter grain is sown following a spring crop, and the land is well tilled and clean. It is better if the surface is uneven as left by the seed drill. And the best time for sowing is usually in the month of March, before the frosts of spring are over, as then the freezing and thawing of the surface will work the seed into the ground, and the spring rains will be sure to bring it up. I know that sowing thus early is objected to by many farmers, fearing that the late frosts of spring will kill the young plant; but I am not aware that the plant is ever killed by frosts, though I have heard this objection to early seeding. During a lifetime, I have often sown clover in midwinter with good success, and we usually see young clover in spring come up on the field where seed had been cut and shelled on the ground the fall previous. But even if we allow that late spring frosts will sometimes kill the germ, the occasions of such frosts are so rare that it is hardly an argument to offset against the dangers from drought in late seeding.

Seed sown after the ground has become settled and firm will not grow unless several successive rainy days follow, which may or may not occur. After the seed springs up, the more rapid its growth the safer it is against early droughts, and to promote this an application of about 150 pounds of gypsum per acre should be given it, and it should be sown as soon as possible after the ground is settled, so that early rains may dissolve and bring it into connection to impart its earliest effect to the young clover. Farmers often fail by sowing plaster too late, and some object to sowing on wheat in spring, that it keeps the wheat green, causing it to shrink; but if sown in proper time it will have no late effect on wheat, and will be almost sure to save the clover. I have never known any perceptible effect of plaster on wheat sown in spring, after a practice of it for more than twenty years, but have always been satisfied of its great benefit to the young clover.

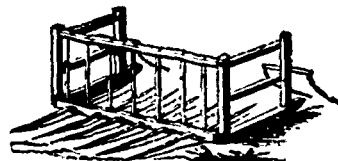
The amount of seed necessary to be sown per acre to insure a good seeding is an important enquiry, and a point on which farmers widely differ. Ten pounds of good seed per acre is sufficient to cover the ground well if evenly sown, and all grows, and twice that amount is no better if it fails to come. Care is necessary to have the seed evenly sown, just as important as the sowing of grain, though it is often heedlessly done, some portions of the ground often receiving no seed, and other portions a double quantity. The operation of hand-sowing is quite difficult, and none but an experienced hand can distribute the seed evenly. The clover sowing machine is a great improvement in the perfection of work, as well as in the saving of labor. The machine is a cheap, simple thing, but of much utility.

## Agricultural Implements.

### The Hay-Sweep and Fork.

It is not a little strange that this useful article is not much more extensively used throughout the country than it is.

The farmer is now enabled, by means of the various appliances, to have his crop cut and raked together or tossed, with a very large saving both of labor and time; yet the amount of loading and unloading still to be done in the field and mow, taxes his energies to the very utmost. Every one who has ever pitched on or off a wagon ten or twelve tons of hay in a day, can bear evidence to the fact that no labor is more fatiguing. The Hay-Sweep is designed to supersede a great portion of this work.



THE HAY-SWEEP.

By the aid of two or three men, two boys and three horses, from twenty-five to thirty tons of hay can readily be packed away per day—with the assistance of the Fork, of course. The Sweep was invented by a Mr. Smith, of Macedon, N.Y., many years ago, although it is as yet apparently so little known.

It is essentially a large, coarse rake, with teeth projecting both ways like those of a common revolver; a horse is attached to each end, and a boy rides each horse. The horses are driven, one on each side of the wind-row, and the rake, coming after them, scoops up the hay as it moves along.

When 500 pounds or more are collected, they draw it at once to the stack or barn, and the horses, simply turning about at each end, thus causing the gates to make half a circle, draw the teeth backwards from the heap of hay, and go empty for another load—the teeth on opposite sides being thus used alternately.

The dimensions of the Hay-Sweep should be as follows: Main or breast bar, a piece of common 4 inch scantling 10 feet long, the one above, the same length and a little lighter. These are about 3 feet apart, connected by 6 or 7 upright wooden bars, 1 1/2 inches square, or thereabout. The teeth are flatfish, 1 inch by 3, and about 5 feet long, or projecting 2 1/2 feet on each side of the centre beam. They must taper, of course, towards the ends so as to run easily under the wind-row. A gate, swinging half way round on very stout hinges, is hung to each end of the rake, and the whistle-trees are attached to these gates. The gates are made, each of two pieces 3 feet long, of common 3 inch scantling, united by 2 bars of wood 1 by 2 inches, and a third at the bottom 3 inches square, and tapering upwards like a sled-runner.

The whistle-trees should be attached a little above the middle of the gate, and so adjusted that they may be raised or lowered as required.

The importance of this simple contrivance will be appreciated from a short calculation. In the first place not a moment is lost in loading or unloading. 2ndly. No attention is needed save that of two little boys to ride the horses. 3rdly. Suppose the horses walk 3 miles per hour (slow travelling), and travel, say a quarter of a mile at each load, they will draw 12 loads of 500 lbs. each, or 3 tons per hour, or 30 tons per day of 10 hours, leaving the men wholly occupied in raising and packing, by the aid of the third horse and the Fork.

The use of the last mentioned article also is not nearly so much appreciated as it ought to be when we consider not only its labor-saving, but its expeditious qualities as well. The effective force of a horse has