

powders like hellebore, air-slaked lime, ashes and pyrethrum about the stems and on the foliage of plants.

Among destructive measures we name early fall plowing which covers up the feed of the young worms and leaves them to starve, late fall and winter plowing which exposes them in their winter quarters to perish, dipping plants to be set in a solution of hellebore (one pound to ten gallons of water), or Paris green (one ounce to eight gallons of water), digging out worms by hand where plants have been cut by them.

An effective method of saving a crop from their ravages is by poisoning them before the plants are set or a crop like corn comes up. To do this, grass, clover, cabbage or turnip leaves are dipped in Paris green water and scattered in small handfuls over the garden or field. A stone or piece of wood laid on it will keep the poisoned trap from drying out or blowing away. The green stuff may be moistened and poisoned plaster or flour dusted over it. Of course, poultry and animals that will be injured by eating the poisoned greens must be kept out of the field.

Kerosene emulsion has been successfully tried at the Department of Agriculture, Washington, D. C., for destroying root eating grubs in grass grounds, and would, without doubt, prove as effectual in killing cut-worms under similar circumstances. The places affected were thoroughly drenched with an emulsion of kerosene in the proportion of one to sixteen, and the ground then well watered. Where this emulsion was used the grubs immediately ceased their depredations, penetrated further into the ground and not a live one was afterward found. For this emulsion, dissolve a quarter pound hard soap in two quarts boiling water, add one pint of kerosene and churn violently until the emulsion "comes." Add to this two gallons of water. Before sprinkling the sod dilute as above.

For cuts and many of the facts herein given we are indebted to a bulletin of The Maine State Experiment Station.

(Farm Journal.)

Farm-Notes.

Montreal, May 1st.

What a pleasure to be able to write the above date! After such a winter the first sensation of genial weather is doubly welcome, and the sight of the expanding buds of the soft-maple, the twittering of the sparrows, already hatching at their first brood, and even the harsh cry of the immigrating crow, and the dull croak of the frogs celebrating their betrothals in the reedy pool, bring the "pleasant-time of spring" poetically present to our eyes. But all is not gold that glitter, nor does the farmer invariably feel at ease when the early days of May present themselves. The hay-mow has shrunk considerably during the past five months; the straw, that was eagerly devoured by the cattle when it came fresh from the threshing-machine, begins to pull on their appetites, and the restlessness of the older cows shows how anxiously they are waiting for a chance to free themselves from the confining chain, and wander at will over the well-remembered pastures. The master of the herd knows very well from past experience, that when a cow once gets "the fidgets," her yield of milk falls off terribly both in quality and quantity. He is sorely tempted to let them out, if only for a couple of hours run, half persuading

himself that it will do neither cows nor the grass much harm.

But, he is *pas si bête*, after a side-tion. He remembers to have read in some old-time newspaper a paragraph stating that Dr. Acland, the Professor of Botany at the University of Oxford, after a series of patiently conducted experiments, proved that if the first spring-shoot of grass is cut or eaten off, the total yield of the plant during the season will be diminished by one-third.

Again; the farmer knows that if once his cattle got a taste of the green grass it will make them dainty; they will turn up their noses at even hay, and as for straw, they will none of it: so, upon the whole, he makes up his mind to keep his stock in the yards till the real flush of growth is on the pastures, and the signs are that the food will last them till the time for cutting green-meet is at hand.

Once more; the grain the farmer has been giving to his milch-cows that are in profit he will not withdraw from them all at once, even if he cannot persuade himself to continue it to them all the season. If they must be deprived of it, he will lessen the rations by degrees, even after they go to grass, for he knows of a certainty that the rank, succulent grass of the early spring has no *proof* in it; that it does not contain anything like the same amount of the elements of fat and casein that the grain does; and that a mixture of foods, moist and dry together, is always more conducive to the health of stock than any one article of food given alone.

Lastly; the farmer, particularly if he cultivates heavy land, remembers that wherever cattle put their feet before the land is fairly dry, a hole is made that retains water like a cup; and that timothy-grass, the chief component of his pastures other than the permanent pastures so rare in this country, is of a bulbous nature of growth, and that *faute de mieux*, if the keep run short, the cattle will tear it up by the roots and an irreparable gap will be the result. Upon the whole, the farmer comes to the conclusion that he will not risk it, and will keep his cattle in their winter quarters till the pastures are really fit to receive them, even though the days be warm and the grass growing nicely.

MALT.

Among the various things we meet with in our exchanges, nothing surprises us more than the various opinions expressed by even practical men as to the feeding value of *Malt*. Senator Cochrane told us, some 20 years ago, that he found it a most valuable addition to the food of his fine herd, but more as a medicine than as a producer of milk or meat; which we interpreted to mean that it acted, like *pepsin*, and aided in the digestion of the ordinary rations.

Now, what is malt? Wherein does it differ from the barley from which it is made?

Malt is thus manufactured: A quantity of barley is steeped in water for a number of hours, varying from 48 hours for 4- or 6-rowed, to 72 for 2-rowed barley: it is then turned out, after draining, into the *couch*, where it lies for a day or so, and after being turned on the *floor*, in layers of varying thicknesses, when the *acrosipre*, or what would become the green shoot (*plumule*), has sufficiently advanced up the back of the grain, the malt is put on the kiln and dried. In the process of drying, the rootlets, by the shortness and bushiness of which the skill of the

maltster is shown, become brittle, and form, what are called in England, *cummings*, a very valuable food for cattle when properly used.

The changes undergone by barley between the *steep* and the *crusher* are given by Dr. Thomson, in his "Experimental Researches into the Food of Animals" as follows:

| | Barley. | | Malt. | |
|----------|---------------|---------|---------------|---------|
| | Natural state | At 212° | Natural state | At 212° |
| Carbon | 41.64 | 46.11 | 42.44 | 43.93 |
| Hydrogen | 6.02 | 6.65 | 6.64 | 7.00 |
| Nitrogen | 1.81 | 2.01 | 1.11 | 1.29 |
| Oxygen | 37.66 | 41.06 | 43.08 | 46.51 |
| Ash | 3.11 | 4.17 | 1.68 | 1.27 |
| Water | 9.46 | ... | 5.05 | ... |
| | 100.00 | 100.00 | 100.00 | 100.00 |

Thus, it will be seen that barley loses carbon, in the form of carbonic acid, and nitrogen, in the form of albumen, while the malt gains hydrogen and oxygen, i. e. water; so that 100 lbs. of barley are reduced by the process of malting to 80 lbs. of the finished product, that is, the loss sustained by the barley in its conversion into malt is something like this:

| | |
|---------------------|-------|
| Water..... | 6.00 |
| Saline matter..... | 0.48 |
| Organic matter..... | 12.52 |
| | 19.00 |

Practically, barley that weighs 56 lbs. a bushel should make malt weighing 44 lbs. a bushel; but, that is not all; the increase of measurement owing to the swell of the grain is from 8 0/10 to 12 0/10, and, in Essex, England, we have even seen as much as 15 0/10 of increase; so that 100 bushels of barley will yield as much as from 108 to 115 bushels of malt. And this will account for what puzzles many people in the English market reports, viz. that while the best Saale barley is worth from 38 to 46 shillings a quarter, the very best malt is quoted at 36 shillings: it is the increased measure that pays the maltster.

Many years ago, when there was a very high duty on malt in England,—it is now levied on the beer—farmers, in that country were very anxious to get the duty taken off, in fact, to have all excise restrictions removed from its manufacture, so that they might malt their own barley for cattle-food. This was granted, with this proviso, that the excise-officers should be allowed to mix some evil-tasting stuff with the malt so made, to prevent its conversion into beer. However, the few farmers—Norfolk men, principally—who tried it soon gave it up, as they found, as the chemist would have told them, that raw barley produced more milk and meat than could be got out of malt.

But, in spite of this, we believe that malt, if there were no duty on it when used as cattle-food, would be a profitable article for milk-production, when combined with other grain. Let us see what is the peculiar behaviour of malt in the brewer's mash-tun.

The operation of malting converted the insoluble starch (*hordein*) in the grain into soluble gum and sugar. But another change took place: part of its nitrogenous matter was converted into a substance called *diastase*, which has the marvellous effect of changing 2,000 lbs. of starch into gum and sugar, when mixed with water at about 160° F. The brewer stirs into a certain quantity of water at that temperature his grist of malt, and after the expiration of about 15 minutes, the thick-mash becomes, in a flash, liquid, and the action of the *diastase* is distinctly visible.

Now, as *diastase* has, as we have seen, the power of converting such an immense quantity of starch into gum first and then into sugar, the *distiller*, who is generally sharp enough, set to work on experiments, and soon discovered that it was not necessary to employ a grist of pure malt for his *mash* but that the addition of 10 lbs., about, of crushed malt to 50 lbs. of ground maize, or other grain, would yield him as great a return of spirits as a grist of pure malt: as great in quantity, that is, though far inferior in quality.

So, if any farmer wishes to use malt though with 2 cts. a pound duty on it, as it has to bear at present, we fear it would hardly pay,—his best plan would be to take 50 lbs. of meal—barley or maize—and after stirring it up in water, at about 175° F., till it is all equally mixed, let him add 10 lbs. of malt, crushed coarsely, and let it stand in a warm place in winter, for an hour or two, close covered. The mixture will be very sweet to the taste, showing that the *diastase* has done its work, partially at least, of converting the starch into sugar. This we believe, even now, would be found a most useful appetiser for bad feeders, and we will engage that, used with a ration of clover-hay-chaff, crushed linseed, and horse-beans or pease, it would bring a horse into show-order quicker than any food that could be exhibited.

DE CANDOLLE.

We regret to say that the great Swiss Botanist, M. de Candolle, is dead. His father, the celebrated Augustin de Candolle was the first *savant* to explode the long-held theory that plants left in the soil certain *excreta* that rendered it inimical to plants of the same species; replacing it by the true principle that plants took so much food out of the soil specifically suited to their wants, that if plants of the same species followed immediately after them, the land was incapable of supplying them with the specific food required.

"PHOSPHATES."

When M. le Comte des Etangs was lately on a lecturing tour, he was surprised to hear people talking about "phosphates," meaning, thereby, chemical fertilisers in general. We have often animadverted on this careless nomenclature in the Journal, and we are glad to see that, at last, the agricultural papers of the United States are beginning to find fault with it. In the "Rural New-Yorker," of March the 20th, we find the following severe expression of opinion—not a whit too severe, though:

Ans.—1. That is a small amount of chemical fertilizer to use if it contains the three most important constituents in the right proportion. Our inquirer speaks of *phosphate*. Does he mean a fertilizer containing phosphoric acid only, or a "complete" fertilizer? It is a pity that both fertilizer firms and rural journals cultivate this stupid misuse of names.

Dr Hoskins, too, has often rebuked the improper phraseology in the Vermont Watchman.

The Largest Farm in England.

There is a larger farm in England than Witheall farm, near Louth. The Apothorpe farms, near Wansford, in Northamptonshire, tenanted by Mr. Andrew Montagu, contain 4,350 acres, of which 2,550 acres are arable, and 1,800 acres pasture. Some ninety-four men and boys are employed in winter,