

Agriculture.

FACTS ABOUT ENSILAGE.

Ensilage is green fodder, preserved in its natural state—corn, millet, oats, peas, clover or grass.

A silo is a pit, cellar or building for storing ensilage.

Most silos have been built like ordinary cellars, of stone and cement, plastered inside, only running up above the ground ten or fifteen feet. The green fodder, cut when in flower, is taken from the field, drawn to the silo and passed through a cutting box, cut into half-inch pieces and carried into the silo, by a carrier similar to a straw carrier. It is evenly spread into the silo and packed by treading, either by men or a horse, or both. Pains must be taken to pack it carefully around the edges, next to the walls. The silo should be filled three or four feet each day, and as much more as can be put in. Tread the ensilage every morning before adding to it. When full cover it with sections of two inch plank, four feet square, and put on from one to three feet of stone for pressure. One foot of stone weighs about one hundred pounds to a square foot. In two months it is ready for use.

The cutting box should be made for the purpose. A good small one can be had for \$100, one that would cut four tons an hour. A large one is better, that can handle ten tons an hour. They will be used as threshing machines now are, going from job to job.

WILL IT KEEP?

Decay comes from moisture, heat or contact with the air. Prevent any one of these three causes, and your fodder will keep. We dry grass and it keeps as hay. Cold storage prevents change. Canned fruits preserve their natural condition. We can shut out the air by pressure, as we make cheese. If we shut out the heat also it helps to preserve. So, underground silos are better. Most ensilage is acid, especially the stalks of corn. Some say this is preferable, as sour kraut is more digestible than cabbage. C. W. Mills says a silo filled in a day and weighted with 300 pounds to the square foot does not get acid. When more than a day is taken for filling a silo, heat is also generated, and the ensilage that was put in the day before is warm to the hand. This passes off, however. Ensilage weighs 45 pounds to the square foot. A bushel basket full weighs 30 pounds, and is a full mess for an ordinary animal fed twice a day. Ten tons of ensilage can be put in the same space occupied by a ton of hay. In feeding you cut out square sections with a hay-knife, and use a basket or cart to move it, handling it with manure forks. Where you cut it down it leaves a solid wall of ensilage, which does not hurt any more than cheese does when you cut it. Have a lower and upper door to your silo. I drive in with a horse and cart on the floor.

WILL IT PAY?

Grass contains 80 per cent. of water. Hay retains 11 per cent., but in round numbers, it takes four tons of grass to make a ton of hay. It takes two and a half tons of hay to winter a cow, consequently it takes tons of grass, in the shape of hay. Six tons in the shape of ensilage will feed the same cow and keep her in better condition. Turnips contain 91 per cent. of water, carrots 87 per cent., beets 85 per cent., potatoes 70 per cent., and yet they are worth raising for feed. The Southern white dent-tooth corn is more generally used for ensilage. It costs about a dollar a bushel in New York. From three pecks to six are used for drilling in. Prepare the land as for corn. Drill in a double row, four inches apart, leaving 28 inches space between the rows, is the best way to plant. This gives from ten to twenty tons to an acre of valuable fodder. Broadcast

corn is not nutritious, except the leaves. It is too young, and grows too closely together to make nourishing food. More weight can be grown in drills. Ensilage should not cost more than two dollars a ton, and two tons of ensilage are equal to one ton of hay. A ton a month is full feed for a cow; so that a cow can be wintered for \$12. With hay at \$8 per ton, it will cost \$20.

HOW DOES IT FEED?

My four-year-old Devon bull, fed on ensilage and barley meal (4 quarts a day), gained 100 pounds in 42 days. An old cow without teeth, weighing 875 pounds, fed on 60 pounds of ensilage and 4 quarts of barley meal, gained 100 pounds in 40 days.

Fine grade short-horned steers coming two years old, having had 30 pounds of ensilage each, and the pickings of the barnyard and nothing else, weigh 800 pounds each, and in the last 71 days have gained 65 pounds each. Fourteen steers have been fed on ensilage for 100 days. They weighed 11,685 pounds (827, each). They have consumed three tons of cornmeal, and now weigh 13,530, a gain per head of 130 pounds in the 100 days. For three weeks they were fed in an open yard, without shelter; then they were housed. They were also covered with lice when bought, and it was a very long, tedious job to get rid of them. They consumed about 70 pounds of ensilage a day, and had no hay, straw or corn-stalks; nor did they drink any water, and they were irregularly fed. In feeding ensilage alone, or with meal, the cattle require no water. They do not scour. The dung is neither dry nor liquid, but of a proper healthy consistency, it appeared digested and the food assimilated. There is no strong smell or odor perceptible in the manure.

For the dairy, ensilage increases the flow of milk from one quarter to one-third, and greatly improves the quality of the butter, so that winter butter cannot be mistaken for oleomargarine. To make the best butter, grain is absolutely necessary; it cannot be made without it, even with ensilage.

THE COST OF A SILO

Depends on its size. It will cost as much as a good cellar, and should be plastered with water lime on the inside and bottom. The trouble in using water lime is, that it is not always used as soon as it should be after mixing. The cement should be fresh ground, and the mortar mixed in small quantities and kept in motion till it is put in its place. It sets like plaster of Paris; and, when once set, is ruined as mortar if it is not where you want it. Keeping it in motion with the hoe or shovel prevents its setting till it is used.

Much testimony goes to show that wooden silos are equally good, built like an ice-house, and filled and weighted with 200 or 300 pounds to the square foot. The objections to rods and screws is, that as soon as you stop tightening the nuts you take off the weight. One must depend on weights, for gravity never forgets to press. A building of rough hemlock, with ten-inch studding (2x10), and joist spiked together and filled in with sawdust or lined with tar paper, and with a board roof coated with crude petroleum, inside and out, set on the ground, the space between the floor and joist filled in with concrete of water lime, will last thirty years and answer a good purpose. Made 16x16x16, like an ice house, it will hold 54 tons of ensilage, enough for 10 head of cattle 6 months, or 60 good sheep. The crude petroleum penetrates the wood, making it shed water like a duck's back, prevents warping, keeps out all the moisture, making hemlock as durable as cedar.

THE COST OF RAISING.

The cost of a corn crop is the cost of corn ensilage. Twenty tons per

acre costs but little more to raise than ten tons to the acre. So the amount raised on an acre governs cost. If using it costs from 30 to 50 cents a ton. I use trucks and flat racks. Drive by the side of the standing corn, cut and drop it across the rack, and when one truck is loaded another takes its place. With ten men and ten horses (sweep power) I easily housed four tons per hour, all the corn within 160 rods of the silo.

E. M. Washburn, of Lennox, Mass., reports the whole cost of corn in silo, exclusive of manure, as \$1.83 per ton; the whole cost of millet in silo, aside from fertilizer, at \$1.03 per ton; with wages for man at \$1.50, man and team \$4 per day.

Col. J. W. Wolcott, Boston, Mass., reports total cost of ensilage at \$2.55 per ton. The large clover, or meadow grass, can be housed cheaper than they can be cured and put into bins, with no danger or delay from weather or storms. No ordinary winter weather seems to injure the ensilage; when cut down for feeding one will see a little frost on the face of the ensilage, but it does not seem to go in a quarter of an inch. Millet is an excellent crop for ensilage; oats, peas and peas and Hungarian grass are all highly recommended, but they should be cut green, when in flower. My earliest cut ensilage is decidedly the best. It takes 100 pounds of grass to make 25 pounds of hay; 50 pounds of ensilage gives as much nourishment as the 25 pounds of hay. We seem to lose one half the nourishment in the grass in curing it.

Ensilage is equally good for sheep, preventing costiveness in lambs and ewes, and permitting the feeding of wethers with full measures of grain and a very decided gain in flesh over dry feed. Stock fed on ensilage and meal do not require water—do not desire it. Store hogs will live on it and do reasonably well. With a small allowance of grain they will gain finely. For horses it takes the place of a bran mash, and with other food is a decided health-giving addition to their food. Poultry take to it as they do to grass, and will work at it and eat it with relish. It is better than roots—it is cheaper than roots; and it will take the place in American agriculture that the root crop did in English agriculture, and permit the consumption of all coarse fodder on the farm at a profit. It will permit one to take fat steers at October prices with a certainty of being able to add two pounds a day to their weight with six cents' worth of ensilage and seven and a half cents' worth (5 pounds) of cornmeal, and enable one to take Christmas prices or carry the steers through the winter without loss.

There is not to exceed ninety days of good pasturage in our whole season. The first growth of grass is immature, and lacking in nourishment; afterwards comes drought, heat and dry pastures. With ensilage one cuts the food in its richest condition, and preserves it, so that it is far ahead of ordinary soiling, and the testimony goes to show that ensilage, seven months old, is more valuable as food than that which is two months old. The small farmer of fifty acres should keep four cows and two horses. He can raise the food for them on six acres of land, and have forty-four acres to cultivate for saleable crops, and the four cows and the poultry will pay the store bill. Calves eat it readily; with ensilage and a little meal it seems practical to raise grade short horns and make them weigh 1,200 pounds at two years of age. That is, we shall be able to raise stock as cheap as we can buy it, or at least that we can raise it without loss in dollars and cents, and that will be a great step in advance. For if we put market value on the food consumed we cannot raise cattle at a profit. With ensilage it can be done.

I built two silos last summer under

side-hill barns—one of 200 tons, and one of 300 tons. I raised only 800 tons of ensilage. I shall raise more, and probably build two wooden silos. If it be true that we destroy nearly half of the nutriment in grass by curing it, we are losing too much. By ensilaging we escape poor hay, and the terrors of a rainy haying time, and have the control of harvesting the grass crop. I have not yet found the man who has tried the experiment who is willing to go back to the old way.—*Cor. The Husbandman.*

Floriculture.

YELLOWS OF THE PEACH TREE.

In the November and December numbers of the *American Naturalist* for 1881, Mr. W. K. Higley has an elaborate paper on the "Microscopic and general characters of the peach tree affected with the yellows." The first symptom mentioned is premature ripening of the fruit, usually an infallible symptom, though not noticed in some localities. Another symptom is the growth of abnormal branches. These are "slender, wire-like shoot, often no larger than a needle, from two to eight inches long." They grow on the main branches and even on the trunk of the tree. Among the microscopical symptoms are the "decided separation of the annual growths of wood." In the spaces thus formed no fungous growth was found, except, perhaps, "the ends of mycelia." Mr. Higley thinks that the soil has no direct effect on the yellows, but that indirectly it does. The point he makes is that a healthy tree, in well cultivated and suitable soil, will not be as liable to attacks of the yellow fungus as a weaker tree. He believes that the disease is "due to a fungoid growth in the aerial portions of the tree." In no case could he find any filaments of a fungus in the roots, or any spores, or any indications that a fungus had been present, even in the roots of a diseased tree. The cells were a little looser than in a healthy tree, but no fungus could be found other than was common on oak roots growing near by.

The disease is spread, in his opinion, by the carrying of spores from one tree to another, by the winds; by budding from diseased trees, and by the pruning knife. In all cases he finds that there must be actual contact of spores with the bark of the branches, and that in infected districts the spores of the fungus are continually floating around, wafted hither and thither by the winds. These seeds, falling on any plant except the peach tree perish for want of proper food, but on the peach tree they grow, send their mycelia through the bark, mature and ripen spores which are scattered by the winds. This, he thinks, is the principal mode of dissemination. In his microscopical examinations, he found no mycelia of this fungus in the roots of a diseased tree. In the trunk he found the fungus on the underside of the inner bark, and next to the cambium layer. In some specimens he found mycelia between the layers of wood. Peculiarly colored spots were found in the wood and in the pith of the tree, but they consisted of cells filled with coloring matter. "The outer bark showed no sign of any fungoid forms." In the branches, at the tips, the tissues seemed to be filled with mycelia. The chlorophyll in the leaves was completely disorganized, as described by Prof. Peck, in the *Country Gentleman* of Oct. 30, 1879. The fruit was covered with mycelia, just under the skin, extending into the flesh only a little way.