

HOME COURSE IN SCIENTIFIC AGRICULTURE

THIRD ARTICLE—BARN- YARD MANURE.

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of Agriculture.

ACCORDING to recent statistics there are in the United States, in round numbers, 19,500,000 horses, mules, etc., 61,000,000 cattle, 47,000,000 hogs and 51,000,000 sheep. Experiments indicate that if these animals were kept in stalls or pens throughout the year and the manure carefully saved the approximate value of the fertilizing constituents of the manure produced by each horse or mule annually would be \$27, by each head of cattle \$20, by each hog \$8 and by each sheep \$2.

These estimates are based on the values usually assigned to phosphoric acid, potash and nitrogen in commercial fertilizers and are possibly somewhat too high from a practical standpoint. Professor Roberts has suggested \$250 as a conservative estimate of the value of the manure produced during seven winter months on a small farm carrying four horses, twenty cows, fifty sheep and ten hogs.

If we assume that one-third of the value of manure is annually lost by present methods of management, and this estimate is undoubtedly a conservative one, the total loss from this source in the United States, as indicated by the first figures, would be about \$708,465,000, or, using Roberts' figures, the annual loss for each farm would amount to \$83.53.

It should be clearly understood that when the farmer sells meat, milk, grain, hay, fruits, vegetables, etc., from his farm, or neglects to save and use the manure produced, he removes from his soil a certain amount of potash, phosphoric acid and nitrogen that must be restored sooner or later if productiveness is to be maintained.

Spring the Time to Haul.
Speaking of the loss of valuable manurial constituents by leaching, fermentation, etc., the Kansas station concludes "that farmyard manure must be hauled to the field in spring, otherwise the loss of manure is sure to be very great, the waste in six months amounting to fully one-half of the gross manure and nearly 40 per cent of the nitrogen that it contained."

It is the prevailing opinion of chemists as well as practical men that where it is practicable it is best to apply manure and urine to the soil in the freshest possible condition. The fertilizing constituents of well rotted manure are more quickly available to plants, and the manure itself is less bulky and easier to distribute. On the other hand, fresh manure mixed with the soil readily undergoes a fermentation which not only increases the availability of its own fertilizing constituents, but also assists in rendering soluble the hitherto insoluble fertilizing constituents of the soil. In fact, even with special precautions to prevent injurious fermentation under the feet of the animals and in the heap, the greatest return is likely to be got from manure applied in the fresh condition.

Methods of Applying Manure.
In applying manure to the field three methods are pursued: First, the manure is placed in larger or smaller heaps over the field and allowed to remain some time before being spread; second, it is broadcasted and allowed to lie on the surface for some time or plowed in immediately, and, third, it is applied in the hill or drill with the seed.

It has been the general experience that probably the best way to utilize barnyard manure is in combination with such materials as supplement and conserve its fertilizing constituents. Certain substances, such as kaffir and superphosphate, which are sometimes employed as preservatives, may also be used to advantage to improve the fertilizing value of the manure, but it is necessary to do more than this if a well balanced fertilizer is desired, for, as has been shown, barnyard manure considered simply as a supplier of nitrogen, phosphoric acid and potash is comparatively poor.

Should Be Saved and Used.

Summarizing the experience of observation in the use of barnyard manure, it may be said that it is the most important manurial resource of the farm and should be carefully saved and used. It represents fertility, which is drawn from the soil and must be returned to it if productiveness is to be maintained. It not only enriches the soil with the nitrogen, phosphoric acid and potash, but it also renders the stored up materials of the soil more available, improves the mechanical condition of the soil, makes it warmer and enables it to retain more moisture.

The urine is by far the most valuable part of the excreta of animals. It is especially rich in readily available nitrogen, which rapidly escapes into the air if special precautions are not taken to prevent its loss. It is also

rich in potash, but deficient in phosphoric acid. It should, as a rule, be used in connection with the solid dung, the one thus supplying the deficiencies of the other and making a more evenly balanced manure.

Barnyard manure is a very variable substance, its composition and value depending mainly upon (1) age and kind of animal, (2) quantity and quality of food, (3) proportion of litter and (4) method of management and age. Ordinary barnyard manure properly cared for may be assumed to contain on the average one-half per cent each of nitrogen and potash and one-third per cent of phosphoric acid.

Mature animals, neither gaining nor losing weight, excrete practically all the fertilizing constituents consumed in the food. Growing animals may excrete as little as 50 per cent of the fertilizing constituents of the food, milk cows excrete from 65 to 85 per cent and fattening or working animals from 85 to 95 per cent. As regards the fertilizing value of equal weights of manure in its normal condition, farm animals probably stand in the following order: Poultry, sheep, pigs, horses and cows.

The amounts of fertilizing constituents in the manure stand in direct relation to those in the food. As regards the value of manure produced, the concentrated feeding stuffs, such as meat scrap, cottonseed meal, linseed meal and wheat bran, stand first; the leguminous plants (clover, peas, etc.) second; the grasses third; cereals (oats, corn, etc.) fourth, and root crops, such as turnips, beets and mangel wurzels, last.

The nitrogen of the food exerts a greater influence on the quality of the manure than any other constituent. It is the most costly fertilizing constituent. It undergoes more modification in the animal stomach than the mineral constituents (potash and phosphoric acid) and rapidly escapes from the manure in fermentation. The secretion of urine increases with the increase of nitrogenous substances in the food, thus necessitating the use of larger amounts of litter and affecting both the amount and value of the manure. The use of watery foods, as is obvious, produces the same result.

Barnyard manure rapidly undergoes change. When practicable to remove the manure and spread it on the field at short intervals the losses of valuable constituents need not be very great.



LOADING MANURE WAGON WITH TROLLEY FROM BARN TO WAGON.

but when the manure must be stored for some time the difficulties of preservation are greatly increased.

The deterioration of manure results from two chief causes, (a) fermentation, whereby nitrogen, either as ammonia or in the gaseous state, is set free, and (b) weathering or leaching, which involves a loss of the soluble fertilizing constituents. The loss from destructive fermentation may be largely prevented by the use of proper absorbents and by keeping the manure moist and compact. Loss from leaching may be prevented by storage under cover or in water tight pits. Extremes of moisture and temperature are to be avoided, and uniform and moderate fermentation is the object to be sought. To this end it is advisable to mix the manure from the different animals thoroughly in the heap.

Effect of Fresh Manure.
Where improvement of the mechanical condition of the soil is the principal object sought fresh manure is best adapted for this purpose to heavy soils and well rotted manure to light soils. Where prompt action of the fertilizing constituents is desired the best results will probably be obtained by applying fresh manure to the light soils, although excessive applications in this case should be avoided on account of the danger of "burning out" of the soil in dry seasons. Fresh manure has a forcing effect and is better suited to early garden truck, grasses and forage plants than to plants grown for seed, such as cereals, or to fruits. Direct applications to root crops, such as sugar beets and potatoes, or to tobacco often prove injurious. The manure should be spread when carried to the field and not left in heaps to leach.

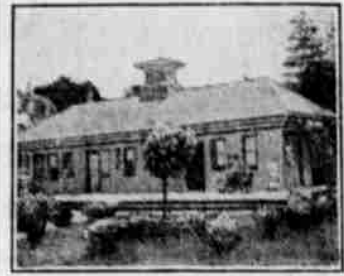
The rate of application must be determined by individual circumstances. As a rule it is better to manure lightly and frequently than to apply a large amount at longer intervals. One of the best ways to utilize barnyard manure is to apply it in connection with such fertilizing materials as supplement its fertilizing constituents. These materials may be either composted with the manure or used separately, except in case of a nitrate, such as nitrate of soda, which should never be composted with barnyard manure on account of danger of denitrification and loss of nitrogen. As is well known, barnyard manure is lasting to its effects and in many cases need not be applied so frequently as the more soluble and quick acting superphosphates and potash and nitrogen salts.

BEAUTIFYING ROAD STATIONS PLEASES THE TRAVELERS

"Eyesores" Do Much to Keep Visitors Away—What One Town Did.

Nowhere are "eyesores" more offensive to the traveling public than those that are sometimes met at country rail road stations. At one stop the traveler is likely to notice a rickety old shanty serving as a station, while at another the building may be up to date, but the surroundings are altogether out of uniformity.

Crosskill, N. J., realized with a start last year that it needed something to



CROSSKILL (N. J.) RAILROAD STATION.

give its railroad station a pleasing appearance. Suggestions began to pour in from various citizens as to what they believed in their opinion was the best suited for the requirements. The most economical and efficient plan was decided upon, with the result that today the station is surrounded with trees and flower bushes, giving the traveler a decidedly good opinion of the town the minute he arrives.

SMALL MEN HATE SUCCESS.

Rival Who Shows Business Ability Makes Him Their Enemy.

Why is it that the outsider who arrives poor in a small town and who, by intelligence and hard work, boasts himself to meretricious prominence, is usually feared, shunned and hated?

He must be an able man. That goes without saying. He is nearly always a public spirited chap and full of the fellow feeling spirit, and his neighbors should be proud of him, but instead they dislike him because he has made a distinct success where they have been plugging along in a rut all the days of their years.

Every man who makes a success of life has to undergo the same sort of thing to some extent. Even Julius Caesar discovered that there were citizens of Rome who were ready to hand him a knife rather than a nosegay.

Yet most towns are full of people who hate the successful man. The smaller merchants waste a great deal of time cussing him. He is abused for the very qualities that should make him popular. If he contributes a handsome sum to any cause, he is not given credit for generosity. "It's all an advertising scheme," say the croakers. He is accused of all sorts of commercial sins, because he is enterprising and employs modern methods as far as they can be employed in a small town.

But, strange to say, he keeps right on being successful.

CITY OWNERSHIP PAYS.

Dover Makes Money on New Water System—May Branch Out.

Municipal ownership has won favor in Dover, N. J., since the report of the water commissioners has shown that the plant under thorough management is returning enough surplus to guarantee the payment of the bonds issued for its construction.

A movement is under way to extend municipal operation to the street and commercial lighting system, which now costs \$6,750 a year.

The saving effected in the water department in hydrant rentals alone was \$4,710. Under the municipal system no rental is paid.

ENCOURAGE TREE PLANTING.

Bill Provides That Connecticut Plantations Be Exempt From Taxation.

A bill which aims to encourage the planting of forest trees has passed the Connecticut house of representatives.

The measure provides that any tract of land of one or more acres planted at the rate of not less than 1,200 trees to the acre and continued as a tree plantation shall be exempt from taxation for not more than twenty years.

Cutting Cost of Living.

A big grocer in Los Angeles has decided to reduce the cost of living 20 per cent without waiting for the government to revise the tariff or bust the trusts.

This is how he does it: Sells only on a cash basis, thus saving the annual expense of \$30,000 for collecting and bookkeeping.

Customers who want to maintain a running account deposit cash and are credited 4 per cent interest on the unused balances.

He abolishes all free deliveries, charging 5 per cent on all goods sent to the customer's house. As he formerly figured 20 per cent as cost of delivery, the customer is ahead to the tune of 15 per cent.

He slashes 20 per cent from the price of all goods on the day that this system was put into practice.

A saving of one-fifth of the grocery bills of the nation would add very materially to the comfort of life in millions of homes.

If the plan works in Los Angeles why isn't it workable anywhere else? Anyhow, you don't have to wait for congress to act before you can try this way of reducing the cost of living.—Wichita Beacon.

Studebaker

"Rough hauling?"
"I don't mind. This is a Studebaker Wagon"
—that's why I bought it. I noticed that men were using the Studebaker wherever the work was hard—hauling steel girders in the city, logs in the woods, stone in the quarry.

"My work is hard and I know it. My wagon is on my payroll and must earn its salary. That's why I bought a Studebaker. I can't afford to buy a cheaper one."

"Get in touch with a Studebaker dealer, he's a good man to know."

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Train schedules and other details will be furnished on request. Baggage checked and sleeping car accommodations arranged through to destination if desired.

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