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## All Purpose Tractor

### Farm Manures: How to Save and Use Them

Article No. 12 on "Farm Facts Every Boy Should Know"

By B. L. Moss

IN 1910, according to the United States Census Bureau, there were in the cotton states 6,219,426 head of horses and mules and 16,678,848 head of cattle. This was an increase over 1900 of 729,336 head of horses and mules, or about 10 per cent, and a decrease of 2,726,735 head of cattle, or about 10 per cent. Assuming that since 1910 the rates of increase and decrease have been the same, we now have in the cotton states 6,592,590 head of horses and mules and 15,678,120 head of cattle.

The best authorities agree that in one year a horse or cow weighing 1000 pounds will produce, in solid and liquid form, manure containing plant food constituents as follows:

PLANT FOOD CONSTITUENTS CONTAINED IN MANURE PRODUCED IN ONE YEAR BY HORSES AND CATTLE FOR EACH 1,000 POUNDS LIVE WEIGHT

Animal	Nitrogen Lbs.	Phos. Acid Lbs.	Potash Lbs.	Plant food constituents Value
Horse	128	43	103	\$32.90
Cow	156	38	127	\$9.45

In these figures nitrogen is figured at 20 cents a pound and phosphoric acid and potash at 5 cents a pound. Present prices are considerably higher, but the above about represent the average under normal conditions.

With this knowledge of the value of the manure produced for each 1000 pound animal or for each 1,000 pounds of live weight, we are in position to calculate the total yearly value of the horse and cow manure produced in the South. It is impossible, of course, for us to say exactly what is the average weight per head of these animals, but we believe that 750 pounds per animal is a conservative estimate. On this basis, the total plant food value of the manure from the horses and mules and cattle in the South is as follows:

TOTAL PLANT FOOD CONSTITUENTS AND TOTAL VALUE IN MANURE PRODUCED BY HORSES AND MULES AND CATTLE IN THE COTTON STATES

	Nitrogen		Phosphoric Acid		Potash		Total value
	Pounds	Value	Pounds	Value	Pounds	Value	
Horses and Mules	843,851,520	\$168,770,304	283,581,370	\$14,179,068.50	679,036,770	\$34,951,828.50	\$217,801,211
Cattle	2,445,786,720	\$489,167,344	595,788,560	\$29,788,428.00	1,991,131,840	\$99,556,592.00	\$618,502,364
Totals	3,289,638,240	\$657,937,648	879,349,930	\$43,967,496.50	2,670,168,610	\$134,508,430.50	\$836,303,575

Here is a total value in manure of 836 millions of dollars a year—enough to build two Panama Canals, with a goodly amount to spare. It is quite true that under average farm conditions it is practically impossible to save the total amount of manure made and put it on the land. Especially is this true where livestock, as is the case in many parts of the South, are allowed to run on the open range. Where given such free range the droppings, to all practical purposes, may be considered wholly lost to the owner of the animals. It is probably not an exaggeration to say that, from one cause or another, Southern farmers on an average do not recover and use to increase their crops and decrease fertilizer bills more than one-fourth of the total amount of manure produced. In other words, we save maybe 200 million dollars worth and let 600 million dollars worth go to waste. At the same time we annually buy from 75 to 100 million dollars worth of commercial fertilizers.

In addition to its plant food value, manure, by reason of its large amount of organic matter, has a great value as a source of humus. This organic matter, in decomposing, serves to unlock and make available to crops the insoluble plant foods already in the soil. For instance, some of our clay soils contain many thousands of pounds of potash per acre, but still applications of commercial potash pay. Under such conditions organic matter or humus is needed, and stable manure is an excellent means of supplying it.

Stable manure has still another value in that it promotes bacterial or germ life in the soil. The germs that convert insoluble nitrogen compounds into soluble nitrate nitrogen, for instance, cannot thrive in a soil without humus; likewise a poor cotton field, almost destitute of humus, furnishes a poor home for the bacteria that live on the roots of clovers, alfalfa, and other legumes.

### How to Save Farm Manures

AS WE have already indicated, it is a practical impossibility to save all of the plant food constituents of our farm manures; but to any one at all observant it is very evident that we can save and use on our fields a vastly great deal more than is now the case. Right here Southern farmers have a tremendous opportunity in saving this manure and using it to increase crop production and add to their wealth. In fact the degree to which we take advantage of this opportunity and use it to the enrichment of our soils and ourselves must in large degree determine our success or failure as farmers.

In the first place, for the sake of the manure saved, if for no other reason, the open range should be abolished and enclosed pastures substituted. In this way the manure from the cattle that run at large would be saved to the owner's land. Moreover, instead of "lying out" at night, there would be a great deal more certainty that every animal would be under a dry shed that would protect both it and the manure from the weather.

Adequate enclosed pastures provided, suitable sheds for every single animal every night are the next needs. For the horses and mules and milk cows, a separate stall for each is generally best; but for the dry cattle an

inexpensive shed, open on one or two or even three sides, will, in our climate, be quite sufficient. When such shelters are provided, care should be taken to see that all animals are kept under them. Manure dropped and left in an open, uncovered lot, exposed to the rains and leaching, very soon loses the best of its plant food constituents. Still, nearly everywhere in the South, we see this very thing going on on farm after farm. No wonder our soils are poor! No wonder we have a big commercial fertilizer bill!

Good drainage is an essential that no barnyard should be without. For the location a slight eminence should, if possible, be chosen; then care must be taken to see that no outside waters are allowed to enter the lot and that what falls on it is carried away before it has a chance to help convert the lot into a sea of filthy mud. Of course extreme care must be exercised to see that no water at all is allowed to find its way into the sheds, stalls or stables themselves.

Since in the liquid manure there is a very considerable proportion (about one-half) of the total plant food value of the manure, it is plain that in order to save the greatest possible amount of the total plant food value, some provision must be made for saving the liquid portion. Perhaps the surest way to do this is to provide water-tight floors of concrete or wood, with gutters for conveying the liquid portions of the manure to a receptacle, whence it may be carried direct to the fields. Such floors are a part of many modern dairy barns.

However, under average Southern



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