

table for the plants. In this connection it is not without interest to note that the old Anglo-Saxon word for the application of stable manure was "gooding," and that the corresponding Scandinavian word is "godning."

fertilizers is probably this, that they will bring good profit by careful management, but that the grower may easily be confronted with considerable loss if he employs fertilizers without knowledge of their nature or of the requirements of his particular



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Composition of Various Barnyard Manures.
(Average figures.)

	P.C. N.	P.C. P.	P.C. K.
Poultry	1.5	1.6	0.95
Horse, solid	0.44	0.35	0.35
Horse, liquid	1.55	0.00	1.50
Cow, solid	0.29	5.31	0.20
Cow, liquid	1.32	0.02	1.48
Pig (uncertain)			
Pig, solid	0.60	0.41	0.26
Pig, liquid	0.43	0.07	0.83
Sheep, solid	0.55	0.31	0.15
Sheep, liquid	1.95	0.01	2.26

Barnyard manure is indirectly the product of the food of domestic animals, and the composition is consequently not stable, but dependent upon the quality and quantity of the feed. Cow and pig manures are known as "cold manures" and should preferably be used on warmer soils, whereas horse and sheep manures are counted as "warm manures," and on that account show a better action on colder clay soils.

Corn and vegetables in general respond better to stable manure than do peas, beans and other legumes, at least on soil in naturally good condition—potatoes and carrots to some extent show better quality after fertilizers than after heavy dressings of stable manure. This, however, does not mean that stable manure should not be employed for these crops on poor land. It refers to naturally good rich soils.

Commercial Fertilizers.

One hears so many contradictory reports in regard to the use of fertilizers that it may seem comparatively difficult for the layman to decide which is right and which is wrong. The truth in regard to artificial

soil. In other words, we must know, and the only way to learn about the needs of the soil is by conducting experiments. The most prominent expert on plant food and nourishment may be able to give intelligent advice, but he is absolutely unable to tell exactly how a certain soil should be manured, or fertilized, unless a proper and carefully planned experiment has been conducted.

**Plan of Experiment.
Demonstrated**

Can we manage with fertilizers alone? Yes, under certain conditions: 1. Provided bacteria are present, i.e., if there is life in the soil; 2, under condition that some humus-supplying crop—preferably legumes—is grown at intervals; 3, if the manager possesses complete knowledge in regard to the needs of his particular soil, and about the nature of the fertilizers he employs.

Conclusion.

We shall find the study of the soil quite uninspiring and prosaic if we become entirely absorbed in its utilitarian aspects and forget to stop and reflect on the infinite wonders in regard to structure as well as to its immense population of invisible but by no means inactive helpers. The soil is not a dead thing. It is a thing in transition, and constant changes are going on in its dark chambers. Dame Nature appears wasteful to the superficial observer, but on closer study we shall find that she uses the same substance over and over again. We know as yet very little, and it behooves us well to look upon the wonders in Nature with respect and admiration.

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