

If no experiments had been ever made, I can readily conceive how, not only bones, but any other manure, applied in this manner, will produce a much greater effect than when applied even in the finest powder. I will not recapitulate the reasons for this opinion here. Under the general head of manures they may be seen—common sense and experience confirm them.

GUANO

Is the next source of supply of phosphates. This substance has been, for the last few years, extensively used as a manure. Besides the phosphates which it contains, a large quantity of ammonia is generated during the decomposition of its azotised matter.

Guano, as is well known, is the dung or fecal matter of various tribes of sea birds deposited on the coast of Africa, South America, and on the Florida coast of the United States. The varieties most usually sold are the Chilian, Peruvian, Patagonian, and the African or Ichaboe Guano. Of these, the first two command much the highest price in the market, the African or Ichaboe being much less valued, and selling for a less price. The difference between the Chilian and Peruvian, and the two latter, depend on the difference of the climate in which they are found. The atmosphere in Peru and Chili is very dry, scarcely any rain falling, and hence the guano, after its deposition, suffers but little change, no water being present to aid the heat in its decomposition; both heat and water being essential to that process in organic substances.

On the coast of Africa and Patagonia, much rain falls, which not only dissolves some of the phosphates in guano, but readily washes out the ammonia as it is formed. These latter varieties, therefore, are never so rich in ammonia as the former, but they frequently contain a larger quantity of phosphates, inasmuch as the ammonia being formed and driven off, the proportion of phosphates in any given quantity will be comparatively greater. The indications for the use of guano, are the absence or deficiency of phosphates in a soil, and the inability of soils to supply themselves with ammonia, for want of power of absorption. The constituents for, and the conditions necessary to this, may be seen under the head of Alumina, Iron, and Sand, in the chapter on the constituents of soils and their properties.

I will, however, state here, that upon open, loose, light, porous soils, that species of guano, containing the largest quantity of ammonia, should be used; but on clayey land, or white oak soils, that kind containing the largest quantity of phosphates is preferable, because these soils can supply themselves with ammonia from the atmosphere. It is a matter, then, of the first importance for the purchaser to be able to know the constituents of guano. At present he cannot know them, unless he employs some chemist, which he had much better do, than to buy and apply guano in the dark. The different specimens of guano differ very much, and the purchaser should know, before buying, the value of each lot that he purchases.