

# Rock phosphate and bone meal

By Adrien Gallant, P Ag.

In the past few years, many farmers have been considering a return to ecologically safer soil management practices such as the use of fertilizer materials which are less refined than those commonly used today. One of the questions farmers ask me is whether they should be using phosphate rock or bone meal on their farms instead of the more highly purified phosphates. Obviously if phosphate rock or bone meal are as effective as the purified phosphates, farmers would be better advised to use those materials.

To find the answer to those questions, one has to go back 150 years to the man who first patented super phosphate. This man is none other than John Bennett Lawes, 1814-1900) the founder of the Rothamsted Experimental Station in Hertfordshire, England. The use of bone as fertilizer dates from Biblical times, since in those days it was known that the best place to plant a vineyard was where there had been a great battle. John Lawes experimented with bones at his farm, treated them with acid and discovered that his crop of turnips more than doubled that produced by using untreated bones. The following is part of John Lawes patent which he was granted in 1842. Whereas bones, bone ash, and bone dust and other phosphoric substances have been heretofore employed as manures, but always, to the best of my knowledge, in a chemically undecomposed state, whereby their action on the soils to which they have been applied has been tardy and imperfect. And whereas it is in particular well known that in the case of a large proportion of the soils of this country, the application of bone dust is of no utility in producing crops of turnips on account of the slow decomposition of the bone dust in the soil, and the consequent exposure of the young plant for a long period to the ravages of the turnip fly. Now, the first of my said improvements consists in decomposing, in manner following, the said bones, bone ash, bone dust, and other phosphoric substances.

Previous to using them for the purposes of manure, I mix with the bones, bone ash, or bone dust, or with apatite or phosphorite, or any other substance containing phosphoric acid, a quantity of sulphuric acid, just sufficient to set free as much phosphoric acid as will hold in solution the undecomposed phosphate of lime

The result of John Lawes' experiment on turnips was:

	Tons per acre
No phosphate	2,2
Mineral phosphate	3,05

From these results it is clear that bones or phosphate rock must be dissolved in acid in order to be effective. Phosphate rock or ground bones may be effective in tropical countries where the soil is very acid and rainfall is heavy. In Ontario, information on the effectiveness of phosphate rock applied to the soil is difficult to find. I wouldn't expect to see immediate results on neutral or alkaline soil. It is possible that acid soils would work on decomposing the phosphates and the bone dust. In any event, if you are interested in testing some of those materials, don't treat your whole farm, try a bit in a field and watch it for several years before drawing any conclusions.

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