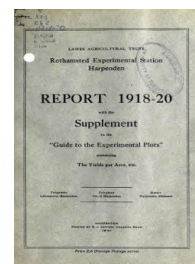


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## Report 1918-20 With the Supplement to the Guide to the Experimental Plots Containing the Yields per Acre Etc.



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### Artificial Farmyard Manure Xlix

#### Rothamsted Research

Rothamsted Research (1921) *Artificial Farmyard Manure Xlix* ; Report 1918-20 With The Supplement To The Guide To The Experimental Plots Containing The Yields Per Acre Etc., pp 57 - 57  
- DOI: <https://doi.org/10.23637/ERADOC-1-109>

gave a rather higher yield with the first crop of barley than the equivalent of nitrate of soda; slate-bed sludge came a long way behind, but still gave an increase of 22% over the unmanured pots. With the second crop of mustard, activated sludge showed a considerable residual value, while the slate-bed sludge was exhausted. Activated sludge is a fertiliser of great promise, but certain difficulties in drying it must be overcome before its value can be fully realised.

XLIX. H. B. HUTCHINSON and E. H. RICHARDS. "*The Utilisation of Straw and the Production of Artificial Farmyard Manure.*" Journal of the Ministry of Agriculture, 1921.

The large increase in arable area brought about by the war at one time seemed likely to result in a glut of straw which could not be profitably utilised in agriculture or industry. Experiments have been going on at Rothamsted for some time with the view to making a nitrogenous and humus-forming manure from straw by bacterial decomposition alone. The nitrogen compounds in straw are inert and play little part in the rotting action of the manure heap. A considerable proportion of the carbohydrate material, however, is easily decomposed. This available starch and pentosan may be used to fix atmospheric nitrogen, and under ideal conditions the amount so gained may double the original nitrogen content of the straw. The cellulose and ligno-cellulose are not decomposed, so that the straw retains its tubular character and in no way resembles well rotted manure, even after prolonged storage. Pot-culture experiments and field trials showed that straw treated in this way possessed little fertilising value. In most cases the depressing action of raw straw on a crop sown at the time of application was merely reduced or eliminated, while under the best conditions the increase of crop over the unmanured soil was very small.

The conditions necessary to secure thorough rotting of straw were then investigated. The more important were found to be :—

1.—*Air supply.* Typical rotting occurs only under aerobic conditions. If air is excluded the straw remains unchanged for six months at least.

2.—*Supply of soluble nitrogen compounds in suitable concentration.* The concentration of even the weakest undiluted urine is above the maximum limit for decomposition. No rotting occurs until the concentration of ammonium carbonate has been sufficiently reduced by volatilisation.

3.—*Temperature.* The most rapid changes occur at about 35° C.

If soluble nitrogen compounds are supplied at the rate of 0.72 parts nitrogen per 100 parts of dry straw, all the added nitrogen is converted from a soluble to an insoluble organic form. Rotting will proceed until about 50 per cent. of the dry matter has been lost. Little or no loss of nitrogen occurs, so that the final product contains about 2.0 per cent. calculated on the dry matter. If soluble nitrogen compounds are added in excess of the limit, loss takes place until the concentration is reduced to the necessary extent when the action proceeds normally.