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## Rothamsted Report for 1936

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### Dried Poultry Manure

#### Rothamsted Research

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		Artificial only	Adco	Straw (1)	Straw (2)
	Barley : grain : cwt. per acre				
Year of application	1934	26.3	25.8	24.5	27.2
	1935	34.7	37.2	39.3	38.4
	1936	34.7	29.1	33.8	33.1
	Mean	31.9	30.7	32.5	32.9
Year after application	1934	25.5	21.3	26.7	26.1
	1935	35.6	35.8	36.7	35.8
	1936	27.5	25.4	28.2	29.1
	Mean	29.5	27.5	30.5	30.3

### DRIED POULTRY MANURE

Experiments on the fertilising value of dried poultry manure were begun at a number of centres in 1933 and have since been continued. Wherever possible horticultural crops have been used and the experiments have been planned to measure possible cumulative and residual effects as well as the immediate effects in the year of application. Except in the first year all plots have received the same total amounts of phosphoric acid and potash so as to restrict the comparisons to the value of organic versus inorganic sources of nitrogen. In 1933 only there were additional tests of the value of the phosphoric acid in the dried poultry manure. Rather over half of the experiments were made on farms with plots of the order of 1/40th acre and the rest of the experiments were carried out very successfully on much smaller plots in school gardens. The average composition of the poultry manures used in the past four seasons has been :

N, 3.65 per cent. ;  $P_2O_5$ , 3.44 per cent. ;  $K_2O$ , 1.68 per cent. There is almost as much phosphoric acid as nitrogen, but the amount of nitrogen may vary considerably according to the rations fed or the condition of the herbage. The material was dried to about 88 per cent. dry matter and was very dirty and unpleasant to handle. The ash content was about 35 per cent.

The results of the first three years showed unmistakably that the immediate effects of poultry manure were generally below those of an equivalent amount of inorganic fertilisers. Thus, at 29 centres showing a clear-out response to nitrogen, the average response of poultry manure was about three-quarters of that from sulphate of ammonia and superphosphate. A smaller number of experiments gave some indication of an appreciably greater residual value from poultry manure than from sulphate of ammonia, but these residual effects were small in comparison with the effects of direct applications.

The above trials took place in three unusually dry summers, and the wet season in 1936 provided considerably larger responses and thus gave a better opportunity of comparing sulphate of ammonia and poultry manure. In the experiments on full sized plots there were significant responses to one or both of the manures at every centre. On microplots 13 out of 15 experiments showed significant effects.

The results in 1936 may be summarised as follows :

	Mean percentage increases over no N			
	No. of expts.	S/A	PM	PM-S/A
Immediate effects .. .. .	14	35.2	25.0	-10.2
Cumulative effects 2nd and 3rd year .. .. .	7	30.3	37.1	+ 6.9

(S/A: sulphate of Ammonia. P.M.: poultry manure)

The immediate effect of poultry manure in 1936 was inferior to that of sulphate of ammonia in 11 out of 14 experiments ; the average difference was 45 per cent. of the mean response. This figure is in good agreement with that observed in the three preceding seasons when the corresponding value was 37 per cent. as a mean of 29 first-year experiments. On the other hand in 6 out of 7 experiments in 1936 where the manures had been repeated for two or more years on the same plots, poultry manure outyielded sulphate of ammonia and the average superiority of poultry manure was 19 per cent of the mean response. These experiments are being repeated and extended to examine this effect more fully.

For crops requiring a good supply of active nitrogen, e.g. kale and roots, sulphate of ammonia showed a marked superiority to poultry manure, but there were indications that poultry manure might have special value for certain other crops. If the full scale experiments of 1936 are grouped according to crops, we obtain :

	No Nitrogen		Single Nitrogen	Double Nitrogen
Kale, tons p.a., 2 expts. ..	9.2	S/A.	11.6	14.2
		P.M.	9.6	10.4
Roots, tons p.a., 3 expts. ..	20.6	S/A.	22.9	24.2
		P.M.	22.3	22.6
Potatoes, tons p.a., 3 expts. ..	5.7	S/A.	7.6	7.4
		P.M.	7.1	7.9
Runner beans, cwt. p.a., 1 expt.	40	S/A.	41	46
		P.M.	51	64

The residual effects of poultry manure after one crop has been grown have so far been very small. In 1936 there were seven experiments bearing on this point, and the average superiority of poultry manure over sulphate of ammonia was only 3 per cent. Since the residual effect of sulphate of ammonia may be taken as negligible, the residual effect of poultry manure applied in the previous season fell far below that commonly assumed for organic manures. As previously mentioned, however, there were indications that the cumulative effects of a series of yearly dressings of poultry manure may be appreciable.