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## Memoranda of the Field Experiments at Rothamsted, May 1873



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## **Experiments on the Economy of Nitrogenous Manures**

## **Rothamsted Research**

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## EXPERIMENTS WITH A VIEW TO ECONOMY IN THE USE OF EXPENSIVE NITROGENOUS MANURES.

It is found that generally less than half the nitrogen supplied in such manures as guano, ammonia-salts, or nitrate of soda, is recovered in the increase of the crop for which they are used; of larger amounts in the usual mode of broadcast sowing and that a considerable quantity may remain in the soil in a comparatively inactive state, yielding increase very slowly; and that a considerable quantity may be carried away by drainage, and lost. It seemed desirable, therefore, to commence a series of different crops.

It is also intended to make experiments with a view to ascertain the best periods of the year for the application of such manures to

FIRST SEASON, 1871. Experiments upon Wheat. Little Hoos Field. Plots 1 acre each.

		PRODUCE PER ACRE.		
Рьот	Manures per Agre, &c.	Dressed Corn.		
No.		Quantity.	Weight per Bushel.	Total Straw.
1	Unmanured. Seed I bushel, dibbled 6 inches apart in the rows	Bushels.	lbs. 59·3	cwts. 24½
2	(146 lbs. (1) Sulphate Ammonia. Seed 1 bushel;	31½	59·1	36 <del>1</del>
3	(292 lbs. Sulphate Ammonia. Seed 1 bushel;	283	58.3	355

(1) Containing Nitrogen equal to that in 15 bushels of grain, with its average proportion of Straw.

Experiments upon Barley. Thirty-acres Field. Plots ½ acre each.

			Produce per Acre.		CRE.
1	PLOT. No.				
		Manures per Acre, &c.	Quantity.	Weight per Bushel.	Total Straw.
	1	Unmanured. Seed 3 bushels; drilled	Bushels. 40½	1bs. 53 • 9	cwts. 24 <sup>5</sup> / <sub>8</sub>
	2	(1 cwt. Superphosphate, 1 cwt. Nitrate Soda. Seed 3 bushels; Manures mixed with Ashes and sown broadcast; seed drilled	497	53.3	30 <u>1</u>
	3	(1 cwt. Superphosphate, 1 cwt. Nitrate Soda, Seed 3 bushels;	491	53.4	281
	4	1 cwt. Superphosphate, 1 cwt. Nitrate Soda. Seed 3 bushels; Manures, Ashes, and Seed mixed, and drilled together	51	<b>53</b> ·0	30g
	5	1 cwt. Superphosphate, 1 cwt. Nitrate Soda. Seed $1\frac{1}{2}$ bushel;	511	53.3	28 <del>1</del>
		(2 cwts. Superphosphate, 2 cwts. Nitrate Soda. Seed 3 bushels; Manures mixed with Ashes and sown broadcast; seed drilled \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	56 <del>1</del>	51.6	327

SECOND SEASON, 1872. Experiments upon Barley. Thirty-acres Field. Plots ½ acre each.

PLOT.	Manures per Acre, &c.	Produce per Acre.		
		Dressed Corn.		
		Quantity.	Weight per Bushel.	Total Straw.
1	Unmanured. Seed 2½ bushels, drilled	Bushels.	lbs, 54·4	cwts. 19½
2	(3 owts. Superphosphate, 2 cwts. Nitrate Soda. Seed 2½ bushels;	461	54.1	301
3	3 cwts. Superphosphate, 2 cwts. Nitrate Soda. Seed 2½ bushels;	477	53.6	311
4	(1 cwt. Superphosphate, 1 cwt. Nitrate Soda. Seed 2½ bushels; Manures and Seed made up to 15 bushels per acre with Ashes, and the whole (Manure, Seed, and Ashes) drilled together	425	54.1	261/2
5	(1 cwt. Superphosphate, 1 cwt. Nitrate Soda. Seed 2½ bushels;	43½	53·1	27

THIRD SEASON, 1873.

Some experiments are in progress in which a given quantity of Nitrate of Soda (generally at the rate of 1 cwt. per acre) has, by means of plaster of Paris and other substances, been made to adhere to the seed, forming a coating upon it. Experiments in pots, well watered and kept in a greenhouse, showed that barley so coated germinated well, and gave strong and healthy plants; but owing to the wetness of the weather previously, to the consequent lateness of sowing, and to the scarcity of rain since, the coated seeds sown in the field have not come up regularly, and it remains to be seen whether the result will eventually be favourable. Even if it were so, there are practical difficulties in the way of so preparing the seed, which might render the method inapplicable in ordinary practice.