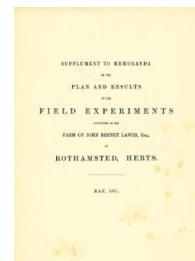


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ROTHAMSTED  
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# Supplement to Memoranda of the Plans and Results of the the Field Experiments at Rothamsted May 1871



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## Memoranda of the Plans and Results of the Field Experiments at Rothamsted May 1871

### Rothamsted Research

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SUPPLEMENT TO MEMORANDA  
OF THE  
PLAN AND RESULTS  
OF THE  
FIELD EXPERIMENTS  
CONDUCTED ON THE  
FARM OF JOHN BENNET LAWES, Esq.,  
AT  
ROTHAMSTED, HERTS.

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MAY, 1871.

BARN FIELD.

EXPERIMENTS ON SUGAR BEET,

TO BE GROWN YEAR AFTER YEAR ON THE SAME LAND, WITHOUT MANURE, AND WITH DIFFERENT DESCRIPTIONS OF MANURE, COMMENCING 1871.

Previous Cropping:—1843-'48 (6 Seasons), experiments on Norfolk White Turnips, with different descriptions of Manure.  
1849-'52 (4 Seasons), experiments on Swede Turnips, with different descriptions of Manure.  
1853-'55 (3 Seasons), Barley without Manure (with a view as far as possible to equalise the condition of the Plots).  
1856-'70 (15 Seasons), experiments on Swede Turnips, with different descriptions of Manure, in which the arrangement of the Plots was

the same, and that of the Manures very similar—in fact, exactly the same during the last 10 years as in the Sugar Beet experiments, excepting that, during that period, the Alkalies were omitted for the Swedes.

FIRST SEASON 1871.

Area under experiment about 8 acres.

The experiments are arranged as under, in 5 Series, each of which comprises 8 Plots.  
Manures stated in quantities per acre.

SERIES 1.		SERIES 2.		SERIES 3.		SERIES 4.		SERIES 5.	
Plots.		Plots.		Plots.		Plots.		Plots.	
1	Farmyard Manure (14 tons).	1	Each Plot as in Series 1, and Cross-dressed with 550 lbs. Nitrate Soda.	1	Each Plot as in Series 1, and Cross-dressed with 400 lbs. "Ammonia-salts."	1	Each Plot as in Series 1, and Cross-dressed with 2000 lbs. Rape-cake, and 400 lbs. "Ammonia-salts."	1	Each Plot as in Series 1, and Cross-dressed with 2000 lbs. Rape-cake.
2	Ditto	2		2		2			
3	Without Manure (for 30 years).	3		3		3			
4	"Superphosphate of Lime"; and Mixed Alkalies (°).	4		4		4			
5	"Superphosphate of Lime"; and 300 lbs. Sulphate of Potass.	5		5		5			
6	Ditto	6		6		6			
7	Ditto	7		7		7			
8	Without Manure 1853 and since; previously part Unmanured, and part Superphosphate.	8		8		8			

(°) 200 lbs. Bone-ash, 150 lbs. Sulphuric Acid (sp. gr. 1.7).

(°) 300 lbs. Sulphate of Potass, 200 lbs. Sulphate Soda, and 100 lbs. Sulphate Magnesia.

(°) Equal parts Sulphate and Muriate of Ammonia of Commerce.

EXPLANATION, FOR CONVERSION INTO FOREIGN WEIGHTS AND MEASURES.

1 acre	.. .. .	=	(about)	0.40	Hectare	.. .. .	or	1.59	Prussian Morgen.
1 lb. (pound avoird.)	.. .. .	=	(about)	0.45	Kilogramme	.. .. .	or	0.91	Zollverein Pfund.
1 cwt. (hundredweight)	.. .. .	=	(about)	51.0	Kilogrammes	.. .. .	or	1.02	Centner.
1 ton	.. .. .	=	(about)	1016.0	Kilogrammes	.. .. .	or	20.33	Centner.
1 lb. per acre	.. .. .	=	(about)	1.12	Kilogrammes per Hectare	or	0.57	Zollv. Pfd. per Pr. Morgen.	
1 cwt. per acre	.. .. .	=	(about)	125.5	Kilogrammes per Hectare	or	0.64	Centner per Pr. Morgen.	
1 ton per acre	.. .. .	=	(about)	2510.0	Kilogrammes per Hectare	or	12.82	Centner per Pr. Morgen.	

EXPERIMENTS WITH DIFFERENT DESCRIPTIONS OF WHEAT, IN 1871;  
AND  
SUMMARY OF RESULTS OBTAINED IN PREVIOUS YEARS.

	DRESSED CORN PER ACRE.					WEIGHT PER BUSHEL.						
	1868; Sawpit Field; 1 cwt. Guano, 1 cwt. Wheat Manure; after Clover.	1869; Thirty Acres Field; 2 cwt. Guano; after Clover.	1870; Sawyer's Field; 4 cwt. Guano; after Fallow.	Average.	1868; Sawpit Field; 1 cwt. Guano, 1 cwt. Wheat Manure; after Clover.	1869; Thirty Acres Field; 2 cwt. Guano; after Clover.	1870; Sawyer's Field; 4 cwt. Guano; after Fallow.	Average.	1868; Sawpit Field; 1 cwt. Guano, 1 cwt. Wheat Manure; after Clover.	1869; Thirty Acres Field; 2 cwt. Guano; after Clover.	1870; Sawyer's Field; 4 cwt. Guano; after Fallow.	Average.
Season 1871. SAWPIT FIELD. 3 Cwts. Guano per Acre, after Mangolds.												
1. Red Wonder .. .. .	Bushels. 51½	Bushels. 54½	Bushels. 51	Bushels. 52½	lbs. 63	lbs. 60½	lbs. 64½	lbs. 62½	lbs. 60½	lbs. 64½	lbs. 62½	lbs. 62½
2. Burwell (Old Red Lammas) .. .. .	41½	48½	48½	46½	64	63	65½	64½	63	65½	64½	64½
3. Bristol Red .. .. .	.. .. .	54½	50	52½	.. .. .	61	65½	63½	61	65½	63½	63½
4. Red Nursery .. .. .	41½	49½	45	45½	66	65	66½	66	65	66½	66	66
5. Red Langham .. .. .	.. .. .	53	49½	51½	.. .. .	61	65½	63½	61	65½	63½	63½
6. Woolly Ear (White) .. .. .	44½	52½	47½	48	64	61½	64½	63½	61½	64½	63½	63½
7. Golden Drop (Red) .. .. .	.. .. .	50½	50½	50½	.. .. .	62½	66	64½	62½	66	64½	64½
8. Golden Drop (Red), Hallett's .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
9. Hunter's White, Hallett's .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
10. Victoria White, Hallett's .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
11. Original Red, Hallett's .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
12. White Chiddam .. .. .	49	49½	45½	48	64½	60½	66½	63½	60½	66½	63½	63½
13. Red Rostock .. .. .	45½	51½	.. .. .	49	63½	61½	.. .. .	62½	61½	.. .. .	62½	62½
14. Casey's White .. .. .	.. .. .	.. .. .	50½	50½	.. .. .	.. .. .	64½	64½	.. .. .	64½	64½	64½
15. Golden Rough-chaff (Red) .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
16. Bole's Prolific (Red) .. .. .	.. .. .	.. .. .	53½	53½	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
17. Club Wheat .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
18. Browick (Red) .. .. .	.. .. .	.. .. .	50½	50½	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
19. Red-chaff (White) .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
20. Maynard's .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
21. Niagara (Red) .. .. .	.. .. .	45½	45½	45½	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
22. Clover's Suffolk Red .. .. .	41½	.. .. .	.. .. .	41½	64	.. .. .	.. .. .	.. .. .	60½	65	.. .. .	62½
Mean .. .. .	45½	50½	49½	48½	64½	61½	65½	63½	61½	65½	63½	63½

## 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 crop obtained by their use; that a considerable quantity may remain in the soil in a comparatively inactive state, and that a considerable quantity may be carried away by drainage and lost. It seemed desirable, therefore, to commence a series of experiments to determine whether any saving can be effected

by applying comparatively small quantities near to the seed, instead of larger amounts as evenly as possible over and throughout the surface soil as in the usual mode of broadcast sowing and harrowing-in. The following experiments were therefore arranged for the present season, 1871.

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 different crops.

### EXPERIMENTS UPON WHEAT; FIRST SEASON, 1871. LITTLE HOOS' FIELD.

4 Plots, about  $\frac{1}{4}$  acre each.

PLOT 1.—Unmanured. Seed, 1 bushel per acre, dibbled, 6 inches apart in the rows.

PLOT 2.—Sulphate of ammonia, 146 lbs. per acre (containing about the same quantity of nitrogen as 15 bushels of grain, with its average proportion of straw). Seed, 1 bushel per acre.

Holes dibbled 6 inches apart in the rows (as for Plot 1); the ammonia-salt, previously ground with an equal weight of fine ashes, put, according to calculated measure, into the holes, and the seed, according to calculated number, put in above the manure.

PLOT 3.—Sulphate of ammonia, 292 lbs. per acre (double the quantity of Plot 2). Seed, 1 bushel per acre.

The ammonia-salt mixed with fine ashes and sown broadcast. Seed dibbled 6 inches apart in the rows.

PLOT 4.—Sulphate of ammonia, 146 lbs. per acre. Seed, 1 bushel per acre.

The ammonia-salt mixed with as little water as would dissolve it, the seed put into the solution, the whole dried up by admixture with dry ashes, and sown broadcast.

### EXPERIMENTS UPON BARLEY; FIRST SEASON, 1871. THIRTY-ACRES' FIELD.

6 Plots, about  $\frac{1}{2}$  acre each.

PLOT 1.—Unmanured. Seed, 3 bushels per acre, drilled.

PLOT 2.—1 cwt. superphosphate, 1 cwt. nitrate of soda, per acre. Seed, 3 bushels per acre. Manures sown broadcast; seed drilled.

PLOT 3.—1 cwt. superphosphate, 1 cwt. nitrate of soda, per acre. Seed, 3 bushels per acre. Manures mixed with fine ashes and drilled; seed drilled above the manure.

PLOT 4.—1 cwt. superphosphate, 1 cwt. nitrate of soda, per acre. Seed, 3 bushels per acre. The manures well mixed with fine ashes, then the seed well mixed with the manure, and the whole drilled together.

PLOT 5.—1 cwt. superphosphate, 1 cwt. nitrate of soda, per acre. Seed,  $1\frac{1}{2}$  bushel per acre.

Holes dibbled 6 inches apart in the rows; the manures well mixed with an equal weight of fine ashes, and put, according to calculated measure, into the holes, and the seed, according to calculated number, put in above the manure.

PLOT 6.—2 cwts. superphosphate, 2 cwts. nitrate of soda, per acre. Seed 3 bushels per acre.

The manures mixed with ashes and sown broadcast. The seed drilled.