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Report for 1933

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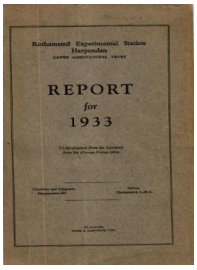

Woburn Experimental Farm Report for 1933

Dr J. A. Voelcker

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WOBURN EXPERIMENTAL FARM REPORT FOR 1932-33

By Dr. J. A. Voelcker, C.I.E., M.A.

The season of 1933 was marked specially by a warm summer and a low rainfall—17.77 inches as against the usual 24 inches. Both autumn and spring crops were sown under favourable conditions.

Apart from some difficulty in securing a good plant of swedes and sugar beet, all crops did well. The summer drought gave an early, but not a deficient harvest.

METEOROLOGICAL RECORDS.

	Rainfall.			*Temperature (Mean).*			
	Total Fall.	No. of Rainy Days.	Bright Sun-shine.	Max.	Min.	1 ft. in Ground.	Grass Min.
1932—	Ins.	No.	Hours.	°F.	°F.	°F.	°F.
Oct. ..	3.43	22	98.4	54.2	40.7	48.8	37.4
Nov. ..	1.22	14	43.2	48.2	38.0	43.7	34.7
Dec. ..	0.48	9	49.6	45.5	35.4	40.5	31.6
1933—							
Jan. ..	1.40	16	63.9	40.7	28.6	37.1	27.1
Feb. ..	1.61	15	94.1	45.1	32.1	39.4	28.6
Mar. ..	2.42	15	185.4	54.0	34.8	43.5	29.5
April ..	1.05	6	150.2	56.6	38.1	50.0	33.2
May ..	1.87	14	163.9	62.8	43.8	56.9	40.1
June ..	1.89	13	220.5	69.5	47.7	64.3	43.9
July ..	1.49	11	254.4	74.5	54.3	69.0	49.0
Aug. ..	0.90	5	246.1	75.2	52.6	67.3	46.6
Sept. ..	1.84	11	171.2	68.0	49.4	61.1	43.8
Oct. ..	1.44	16	87.2	55.9	43.5	50.9	39.1
Nov. ..	1.52	17	48.7	46.1	36.5	43.5	32.5
Dec. ..	0.34	11	43.2	37.5	28.5	34.4	24.0
Total or mean for 1933 ..	17.77	150	1728.8	57.2	40.8	51.4	36.4

CONTINUOUS GROWING OF WHEAT AND BARLEY.

Stackyard Field, 57th Year
(No manure since 1926)

Wheat.—"Red Standard" wheat, at the rate of 12 pecks per acre, was drilled on Nov. 17th, 1932. The land, especially on the ammonia-salts plots (2, 5, 8) was still very weedy, particularly with twitch, and the plots mentioned suffered from the winter frosts. But, on the whole, the wheat came up well and not much damage was done by birds, thanks to continual watching. The effect of lime—though last applied in 1918 or earlier, was still to be noticed.

The farmyard manure and nitrate of soda plots continued to look better than the ammonia ones, but were more weedy.

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A weed survey disclosed some changes from the earlier weed population. Of various weeds known as "twitch," the most prominent was *Holcus mollis*, unknown in earlier years. *Agrostis vulgaris* (creeping bent grass) was another later introduction, while the ordinary twitch (*Triticum repens*) was hardly present. Nothing but hand-hoeing was successful in keeping these weeds in check. Other weeds that showed up were mayweed, veronica, convolvulus, hogweed, coltsfoot, vetchling and poppy. Mayweed, while abundant on the limed plots, did not occur on very acid plots (2, 5, 8); it was very prevalent on the nitrate of soda plots, and on these latter and on the farmyard manure plots vetchling throve in particular. By the time of harvest the unmanured plots were a mass of mayweed and *Holcus mollis*. The dry weather, weeds, and absence of manures resulted in low yields. The crop results are given in Table I.

Table I.—CONTINUOUS GROWING OF WHEAT, 1933.
Stackyard Field—Produce per acre.

Plot.	Manures Applied Annually to 1926 (followed by two years Fallow 1926-28). For amounts see Report 1927-28. No Manures since 1926.	Dressed Corn per acre. Bushels	Weight per bushel. lb.	Tail Corn. lb.	Straw Chaff, etc., per acre. cwt.
1	Unmanured	2.6	57.5	6	6.96
2a	Sulphate of Ammonia	1.1	57.0	8	1.89
2aa	As 2a, with 5 cwt. Lime, Jan. 1905, repeated 1909, 1910, 1911	.8	57.0	8	1.71
2b	As 2a, with 2 tons Lime, Dec., 1897	2.5	57.0	12	3.07
2bb	As 2b, with 2 tons Lime, repeated Jan., 1905 ..	1.8	57.0	8	3.50
3a	Nitrate of Soda = 50 lb. Ammonia	2.2	57.0	6	5.25
3b	Nitrate of Soda = 25 lb. Ammonia	1.5	57.0	6	2.98
4	Mineral Manures (Superphosphate and Sulphate of Potash)	4.0	57.0	10	9.87
5a	Mineral Manures and Sulphate of Ammonia ..	3.7	57.0	4	4.07
5b	As 5a, with 1 ton Lime, Jan., 1905	1.4	57.0	4	2.39
6	Mineral Manures with Nitrate of Soda ..	2.6	57.0	3	3.73
7	Unmanured	4.0	54.8	7	8.96
8a	Mineral Manures and, in alternate years, Sulphate of Ammonia	1.0	57.0	4	1.61
8aa	As 8a, with 10 cwt. Lime, Jan., 1905, repeated Jan., 1918..	3.6	57.0	8	4.93
8b	Mineral Manures and Sulphate of Ammonia (omitted in alternate years)	1.3	57.0	4	2.32
8bb	As 8b, with 10 cwt. Lime, Jan., 1905, repeated Jan., 1918..	4.1	57.0	8	6.10
9a	Mineral Manures and, in alternate years, Nitrate of Soda	1.8	57.0	4	4.52
9b	Mineral Manures and Nitrate of Soda (omitted in alternate years)	3.2	57.0	6	5.39
10a	Superphosphate and Nitrate of Soda	2.2	57.0	6	5.28
10b	Rape Dust	1.5	57.0	4	4.07
11a	Sulphate of Potash and Nitrate of Soda ..	2.7	57.0	6	5.41
11b	Farmyard Manure	3.5	57.0	4	7.16

Barley.—"Plumage Archer" barley, at the rate of 6 pecks per acre, was sown on March 23rd, in drills 18 inches apart to facilitate weeding. Notwithstanding the cleaning work already done, the plots were very weedy, especially with spurry. A newcomer, coltsfoot, also appeared, especially on the nitrate of soda plots.

Here, as with the wheat plots, the farmyard manure and limed plots seemed to be the best.

Owing to the dry weather, to weeds, and the absence of manures, a very small crop was obtained.

The results are given in Table II.

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Table II.—CONTINUOUS GROWING OF BARLEY, 1933.
Stackyard Field—Produce per acre.

Plot.	Manures Applied Annually to 1926. (followed by two years' Fallow 1926-28). For amounts see Report 1927-28. No manures in 1929, 1930, or 1933. For manures in 1931 and 1932 see footnote.	Total Corn per acre. lb.	Straw, Chaff, etc., per acre. cwt.
1	Unmanured	10	4.17
2a	Sulphate of Ammonia	—	—
2aa	As 2a, with 5 cwt. Lime, Mar., 1905, repeated 1909, 1910, 1912 and 1923	28	5.57
2b	As 2a, with 2 tons Lime, Dec., 1897, repeated 1912	28	4.93
2bb	As 2a, with 2 tons Lime, Dec., 1897, repeated Mar., 1905	24	5.57
3a	Nitrate of Soda=50 lb. Ammonia	40	7.78
3aa	As 3a, with 2 tons Lime, Jan., 1921	48	7.78
3b	Nitrate of Soda=25 lb. Ammonia	40	7.00
3bb	As 3b, with 2 tons Lime, Jan., 1921	48	7.17
4a	Mineral Manures (Superphosphate and Sulphate of Potash)	36	5.32
4b	As 4a, with 1 ton Lime, 1915	18	4.25
5a	Mineral Manures and Sulphate of Ammonia	12	9.00
5aa	As 5a, with 1 ton Lime, Mar., 1905, repeated 1916	56	7.28
5b	As 5a, with 2 tons Lime, Dec., 1897, repeated 1912	26	6.89
6	Mineral Manures and Nitrate of Soda	55	8.03
7	Unmanured	19	4.19
8a	Mineral Manures and, in alternate years, Sulphate of Ammonia	—	—
8aa	As 8a, with 2 tons Lime, Dec., 1897, repeated 1912	52	10.21
8b	Mineral Manures and Sulphate of Ammonia (omitted in alternate years)	—	—
8bb	As 8b, with 2 tons Lime, Dec., 1897, repeated 1912	72	10.78
9a	Mineral Manures and, in alternate years, Nitrate of Soda	64	14.78
9b	Mineral Manures and Nitrate of Soda (omitted in alternate years)	70	16.03
10a	Superphosphate and Nitrate of Soda	54	7.32
10b	Rape Dust	44	6.32
11a	Sulphate of Potash and Nitrate of Soda	40	11.53
11b	Farmyard Manure	146	17.39

Manuring in 1931 and 1932:

Plots.	Quantity per acre.
1-7	Unmanured.
8a, 8b, 8aa, 8bb	3 cwt. Superphosphate, 1½ cwt. Sulphate of Potash, 1¾ cwt. Sulphate of Ammonia.
9a, 9b	3 cwt. Superphosphate, 1½ cwt. Sulphate of Potash, 2.28 cwt. Nitrate of Soda.
10a	3 cwt. Superphosphate, 2.36 cwt. Nitrate of Soda.
10b	Unmanured.
11a	1½ cwt. Sulphate of Potash, 2.36 cwt. Nitrate of Soda.
11b	Unmanured.

ROTATION EXPERIMENTS

THE UNEXHAUSTED MANURIAL VALUE OF CAKE AND CORN (STACKYARD FIELD) 1933.

Series C. The clover (alsike) stubble of 1932 was ploughed in, and "Red Standard" wheat, at the rate of 12 pecks per acre, was drilled on October 17th, 1932. The wheat came up well and gave an excellent crop for this land. It was cut on July 28th. The results are given in Table III.

Table III.—WHEAT AFTER CLOVER.
Produce per acre.

Plot.	*Head Corn.* Bushels.	*Head Corn.* Weight per Bushel lb.	*Tail Corn.* lb.	*Straw, Chaff, etc.* cwt.
1. Cake-fed	25.0	63.7	9.7	21.5
2. Corn-fed	28.5	63.7	12.4	24.0

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This soil has only 0.104 per cent. of nitrogen; the soil of Series A (green-cropping), with hardly less nitrogen (0.96 per cent. and 0.100 per cent.N.), gave, in the same year and on the same land, only about 9 bushels of wheat per acre.

Series D.—Swedes, that followed the wheat crop of 1932, gave a small but uniform crop. The yields are given in Table IV.

Table IV.—SWEDES, 1933, FOLLOWING WHEAT.
Produce per acre.

Plot.	*Roots.* Tons.	*Tops.* Tons.
1. Cake-fed	9.87	1.41
2. Corn-fed	7.89	1.31

The root-crop was divided equally between the two plots and fed off by sheep. One lot of sheep had 30 cwt. of mixed Linseed and Cotton cake, the other lot 30 cwt. of mixed wheat, barley and oats, giving respectively 75.6 lb. and 26.4 lb. nitrogen per acre.

GREEN CROP AND GREEN MANURING EXPERIMENTS

(a) *Stackyard Field—Series A.*

Upper half, 1933. *Wheat after Green crops fed off by Sheep.*

"Red Standard" wheat, at the rate of 12 pecks per acre, was drilled on November 3rd, 1932. It came up well, but the land was not clean; the principal weeds were mayweed and veronica with poppy, especially on the tares portion.

After March the wheat fell away as is usually the case.

The crop was cut on August 8th. The results are given in Table V.

Table V.—GREEN MANURING EXPERIMENT.
WHEAT AFTER GREEN-CROPS FED OFF BY SHEEP.
Stackyard Field, 1933. Produce per acre.

Plot.	*Head Corn.*		*Tail Corn.*	*Straw, Chaff, etc.*
	Bushels.	Weight per Bushel. lb.	lb.	cwt.
1. After Mustard fed off (unlimed) ..	10.1	62.1	8	12.3
2. After Mustard fed off (limed) ..	9.2	59.2	9	12.8
3. After Tares fed off (unlimed) ..	11.6	61.8	13	15.0
4. After Tares fed off (limed) ..	8.8	58.1	12	15.5

The yields are, as usual, low.

Lower half, 1933. *Green Crops.*

After removal of the wheat crop of 1932, twitch was picked out as far as possible. Tares—3 bushels per acre—were sown on April 26th, 1933, and mustard—60 lb. per acre—on May 12th, and gave

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fair crops. They were grazed July 12th to 31st, by sheep which had 1½ cwt. of mixed cake per acre, supplying an additional 8 lb. of nitrogen per acre. To permit further cleaning of the land, no second crop was grown. Wheat was sown on October 23rd.

Table VI gives particulars regarding the green crops.

Table VI.—GREEN-MANURING EXPERIMENT. STACKYARD FIELD, 1933. Lower Half.

Plot.	Green Matter. per acre. lb.	Dry Matter. per acre. lb.	Total Nitrogen per acre. lb.
Mustard (unlimed)	4000	1144	20.1
Mustard (limed)	2950	874	14.5
Tares (unlimed)	6676	1322	39.9
Tares (limed)	10238	1822	65.3

The mustard contained on the average 1.7 per cent. of nitrogen; the tares 3.3 per cent. Lime gave a marked increase in the yield of tares.

(*b*) *Lansome Field.*

Here wheat followed the ploughing-in of the green crops of 1932, "Red Standard" wheat at the rate of 12 pecks per acre being sown on October 11th, 1932. It grew and ripened well, though weeds—chiefly chickweed, veronica, and mayweed—were rather abundant. It was cut on July 28th. The results are given in Table VII.

Table VII.—WHEAT AFTER GREEN-CROPS PLOUGHED IN. Lansome Field, 1933. Produce per acre.

Plot.	*Head Corn.*		*Tail Corn.*	*Straw, Chaff, etc.*
	No. of Bushels.	Weight per Bushel. lb.	lb.	cwt.
1. Mustard old series	9.1	60.9	17	12.7
2. Tares old series..	9.1	61.4	10	12.2
3. Mustard new series	9.8	61.6	13	11.7
4. Tares new series	9.3	62.0	12	11.5
5. Control new series	8.4	63.0	7	9.4

The yields are small and differ little from those given in Table V.

LUCERNE INOCULATION, LANSOME FIELD

This experiment was started in 1932 when two cuts were taken which gave together, as hay, 0.70 and 0.68 tons per acre, respectively, from the non-inoculated and inoculated plots.

The plots were then harrowed on four occasions, and hand-hoed, and twitch was also dug out. Owing to the drought, only two cuts were taken in 1933.

The green-weights, hay-weights, and nitrogen contents were determined. The results are given in Table VIII.

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Table VIII.—LUCERNE INOCULATION EXPERIMENT.

	Green. Tons per acre.	*Hay.* Tons per acre.	*Nitrogen.* lb. per acre.
Inoculated	8.98	3.12	157.0
Non-inoculated	9.36	3.28	152.8

The inoculated plants contained a higher percentage of nitrogen and gave a slightly higher yield of nitrogen per acre, although their total weight was less than the non-inoculated plants.

MANURING OF GRASS LAND, BROAD MEAD, 1933

The area was again fed this year by sheep, so that there are no crop weights to record. The herbage has been much improved by the heavy grazing, especially on the farmyard manure plot (5); daisies on the lime plot (4) are now much reduced in numbers.

During the winter the lime plot (4) and that with superphosphate and sulphate of potash (3) were the greenest. In the spring, mole-hills were most plentiful on the lime plot.