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Report for 1923-1924 With the Supplement to the Guide to the Experimental Plots Containing the Yields per Acre Etc.



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Size of Dressing and Time of Application

Rothamsted Research

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of ammonia in the experiments at Rothamsted and at outside centres inspected by us were as follows :—

| | 1922 Rothamsted. | 1923 Rothamsted. | 1924 Rothamsted. | Outside Centres. | Average of all Soils and Seasons to 1920 |
|-----------------|---------------------|---------------------|---------------------|---------------------|--|
| Wheat, bu. ... | 3.25 | | | 4.3-6 | 4.5 |
| Barley, bu. ... | 5.5 | 4.5 | 8.16 | 3.5 | 6.5 |
| Oats, bu. ... | | 8.3 | | | 7 |
| Potatoes, cwt. | 20 | 22-25 | 20 | | 20 |
| Swedes, cwt. | 20 | 25 | 5-9 | 30 | 20 N. Country 10 S. Country |

SIZE OF DRESSING AND TIME OF APPLICATION.

The effect of doubling the nitrogenous dressing and supplying 2 cwt. sulphate of ammonia per acre is to give a further increase in crop. In the case of cereals this second increase is not infrequently greater than the first, so that the effect of the double dressing is to give more than double the increase obtained from the single one. This was shown both in 1923 and 1924; the yields per acre were :—

| | No Nitrogen. | 1 cwt. Sulphate of Ammonia. | 2 cwt. Sulphate of Ammonia. | Increment in Yield for 1st cwt. 2nd cwt. | |
|-------------------|-----------------|-----------------------------------|-----------------------------------|---|------|
| 1923 Oats, bu ... | 29.2 | 37.3 | 46.5 | 8.1 | 9.2 |
| Straw, cwt. | 19 | 26 | 36 | 7 | 10 |
| 1924 Barley, bu. | 23.9 | 32.5 | 42.7 | 8.6 | 10.2 |

In the case of potatoes, however, the second increment in yield is usually less than the first, though the total effect of the higher dressing still remains profitable because of the higher value of the potato crop.

The results have been, in tons per acre :—

| | No Nitrogen. | 1½ cwt. Sulphate of Ammonia. | 3 cwt. Sulphate of Ammonia. | 4½ cwt. Sulphate of Ammonia. | Increment in Yield for 1st dose. 2nd dose. 3rd dose. | | |
|----------|-----------------|------------------------------------|-----------------------------------|------------------------------------|---|-----|-----|
| 1923 ... | 12.0 | 13.7 | 15.1 | 14.8 | 1.7 | 1.4 | Nil |
| 1924 ... | 8.0 | 9.5 | 9.4 | — | 1.5 | Nil | — |

The effect of the nitrogenous dressing depends on its time of application. For cereals it has happened that the later dressings, especially when large, have been more effective than the earlier ones (p. 118). For potatoes it has hitherto always happened at Rothamsted that the application of the sulphate of ammonia with the seed has been more effective than the later top dressing when the plants are showing through the ground. Swedes appear to behave in the opposite way. The physiological basis of this problem of nitrogen intake and nitrogenous efficiency is being studied by Dr. Gregory.