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# Yields of the Field Experiments 1971

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## 71/S/RN/1 Rotation I - Grass, Lucerne

### Rothamsted Research

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71/S/RN/1

ROTATION I

Object: To compare nutrient cycles, uptakes of nutrients and responses to fresh P and K of lucerne and grass leys. To obtain an estimate of the rate of release of nutrients, particularly K, from Saxmundham soil. The effects of lucerne and grass leys will be compared on subsequent arable crops - Saxmundham.

For previous years see 'Details' 1967, 68/A/9(t) and 69-70/S/RN/1(t).

Whole plot dimensions (new plots): 5.49 x 17.1. Area harvested: Grass: 0.00139, lucerne: 0.00111.

Cultivations, etc.:-

Grass: P and K applied: 21 Jan, 1971. Bonemeal applied: 19 Feb.  
N applied: 1 Apr. Cut: blocks 1 and 2 - 11 May, 1 July, 6 Oct, blocks 3 and 4 - 18 May, 6 July, 6 Oct. N applied after each cut except the last. Varieties: Timothy (S.352) and Meadow Fescue (S.215).

Lucerne: P and K applied: 21 Jan, 1971. Bonemeal applied: 19 Feb.  
Cut: 25 May, 27 July, 7 Sept. Variety: Europe.

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SUMMARY OF RESULTS

OLD TREATMENTS

GRASS, DRY MATTER: TONNES/HECTARE

| Treatment<br>1899-1971 | 1st cut | 2nd cut | 3rd cut | Total of 3 cuts |
|------------------------|---------|---------|---------|-----------------|
| D                      | 4.39    | 1.27    | 1.18    | 6.84            |
| B                      | 2.57    | 0.93    | 0.41    | 3.91            |
| N                      | 3.83    | 1.94    | 1.60    | 7.37            |
| P                      | 1.95    | 0.96    | 0.36    | 3.27            |
| K                      | 1.49    | 0.83    | 0.24    | 2.56            |
| -                      | 1.84    | 0.84    | 0.44    | 3.12            |
| PK                     | 2.18    | 0.85    | 0.31    | 3.34            |
| NK                     | 3.50    | 1.87    | 1.92    | 7.29            |
| NP                     | 3.68    | 2.40    | 2.08    | 8.16            |
| NPK                    | 4.01    | 2.43    | 2.15    | 8.58            |
| Mean                   | 2.94    | 1.43    | 1.07    | 5.44            |

Mean D.M. %: 1st cut: 26.0  
 2nd cut: 30.4  
 3rd cut: 40.6  
 Total of 3 cuts: 32.3

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NEW TREATMENTS

GRASS, DRY MATTER: TONNES/HECTARE

| Treatment<br>1899-1965 | Treatment*<br>from 1966 | 1st cut | 2nd cut | 3rd cut | Total of<br>3 cuts |
|------------------------|-------------------------|---------|---------|---------|--------------------|
| D                      | DN1                     | 4.95    | 3.61    | 4.72    | 13.28              |
| B                      | B                       | 3.81    | 3.30    | 4.54    | 11.65              |
| N                      | N2P2                    | 4.55    | 3.49    | 4.22    | 12.25              |
| P                      | N1P1                    | 4.10    | 3.66    | 4.39    | 12.16              |
| K                      | N1P2K                   | 3.62    | 3.52    | 4.20    | 11.34              |
| -                      | N1P2                    | 4.57    | 3.49    | 4.31    | 12.36              |
| PK                     | N1P1K                   | 3.82    | 3.72    | 4.15    | 11.70              |
| NK                     | N2P2K                   | 4.22    | 3.47    | 4.41    | 12.11              |
| NP                     | N2P1                    | 4.22    | 3.39    | 4.31    | 11.92              |
| NPK                    | N2P1K                   | 3.97    | 3.51    | 4.39    | 11.86              |
| Mean                   |                         | 4.18    | 3.52    | 4.36    | 12.06              |

Mean D.M. %: 1st cut: 23.1  
 2nd cut: 20.7  
 3rd cut: 40.0  
 Total of 3 cuts: 27.9

\* N not tested since 1970 - all treatments receive basal N at 100 kg for each cut. FYM last applied autumn 1969.

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NEW TREATMENTS

LUCERNE, DRY MATTER: TONNES/HECTARE

| Treatment<br>1899-1965 | Treatment*<br>from 1966 | 1st cut | 2nd cut | 3rd cut | Total of<br>3 cuts |
|------------------------|-------------------------|---------|---------|---------|--------------------|
| D                      | DN1                     | 5.74    | 5.34    | 3.21    | 14.30              |
| B                      | B                       | 4.75    | 4.86    | 2.75    | 12.37              |
| N                      | N2P2                    | 4.83    | 4.81    | 2.75    | 12.39              |
| P                      | N1P1                    | 4.89    | 4.92    | 2.72    | 12.53              |
| K                      | N1P2K                   | 4.88    | 5.36    | 2.93    | 13.17              |
| -                      | N1P2                    | 5.06    | 5.17    | 2.82    | 13.05              |
| PK                     | N1P1K                   | 5.08    | 5.32    | 2.93    | 13.33              |
| NK                     | N2P2K                   | 5.22    | 5.29    | 2.93    | 13.44              |
| NP                     | N2P1                    | 5.08    | 4.62    | 2.74    | 12.43              |
| NPK                    | N2P1K                   | 5.25    | 4.85    | 3.03    | 13.13              |
| Mean                   |                         | 5.08    | 5.05    | 2.88    | 13.01              |

Mean D.M. %: 1st cut: 17.1  
 2nd cut: 24.7  
 3rd cut: 22.1  
 Total of 3 cuts: 21.3

\* N not applied since 1970. FYM last applied autumn 1969.