

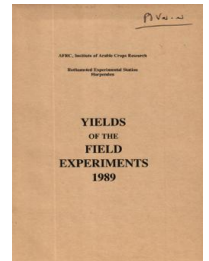
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89/R/HB/2 Hoos Barley - S. Barley

Rothamsted Research

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89/R/HB/2

HOOS BARLEY

Object: To study the effects of organic and inorganic manures on continuous s. barley. From 1968 to 1978 a rotation of potatoes, beans and s. barley was practised. The rotation was discontinued in 1979 and the experiment reverted to continuous s. barley.

The 138th year, s. barley.

For previous years see 'Details' 1967 and 1973, Station Report for 1966 and 74-88/R/HB/2.

Treatments: All combinations of:-

1. **MANURE** Fertilizers and organic manures:

| | Form of N 1852-1966 | Additional treatments 1852-1979 | Changes since 1980 |
|-------|------------------------|---------------------------------------|--------------------------|
| --- | None | - | - |
| -P- | None | P | - |
| --K | None | K (Na) Mg | - |
| -PK | None | PK (Na) Mg | - |
| A-- | A | - | - |
| AP- | A | P | - |
| A-K | A | K (Na) Mg | - |
| APK | A | PK (Na) Mg | - |
| N---- | N | - | - |
| NP--- | N | P | - |
| N-K-- | N | K (Na) Mg | - |
| NPK-- | N | PK (Na) Mg | - |
| N--S- | N | Si | Si omitted |
| NP-S- | N | P Si | " |
| N-KS- | N | K (Na) MgSi | " |
| NPKS- | N | PK (Na) MgSi | " |
| N---S | N | - | Si added |
| NP--S | N | P | " |
| N-K-S | N | K (Na) Mg | " |
| NPK-S | N | PK (Na) Mg | " |
| N--SS | N | Si | - |
| NP-SS | N | P Si | - |
| N-KSS | N | K (Na) MgSi | - |
| NPKSS | N | PK (Na) MgSi | - |
| C(--) | C | - | PKMg omitted |
| C(P-) | C | P | " |
| C(-K) | C | K (Na) Mg | " |
| C(PK) | C | PK (Na) Mg | " |
| D | None | D | - |
| (D) | (D) | - | - |
| (A) | (Ashes) | - | - |
| - | None | - | - |

89/R/HB/2

Form of N: A, sulphate of ammonia; N, nitrate of soda - each to supply 48 kg N; C, castor meal to supply 96 kg N
P: 35 kg P as single superphosphate (triple superphosphate in 1974 and 1988)
K: 90 kg K as sulphate of potash
(Na): 16 kg Na as sulphate of soda until 1973
Mg: 35 kg Mg, as kieserite every third year since 1974 (sulphate of magnesia annually until 1973)
Si: Silicate of soda at 450 kg
D: Farmyard manure at 35 tonnes. (D): until 1871 only
(Ashes): Weed ash 1852-1916, furnace ash 1917-1932, none since

2. N Nitrogen fertilizer (kg N), as 'Nitro-Chalk', since 1968 (cumulative N applications until 1973, on a cyclic system since 1974):

0
48
96
144

Plus extra plots testing all combinations of:-

1. MANURE Fertilizers other than magnesium:

551AN2PK Plot 551 AN2PK
561--PK Plot 561 --PK
571NN2-- Plot 571 NN2
581NN2-- Plot 581 NN2

N2: 96 kg N as 'Nitro-Chalk' since 1968. Other symbols as above.

2. MAGNESIUM Magnesium fertilizer (kg Mg) as kieserite every third year since 1974:

0
35

NOTE: For a fuller record see 'Details' etc.

Basal applications: Manures: Chalk at 2.5 t. Weedkillers: Glyphosate at 1.4 kg in 200 l. Mecoprop at 1.6 kg with ioxynil at 0.20 kg and bromoxynil at 0.20 kg in 200 l. Fungicides: Propiconazole at 0.12 kg with fenpropimorph at 0.75 kg in 200 l.

Seed: Triumph, seed dressed flutriafol, ethirimol and thiabendazole, sown at 160 kg.

Cultivations, etc.: - Glyphosate applied: 2 Oct, 1988. Chalk applied: 28 Nov. Silicate of soda applied: 7 Dec. Mg and K applied: 8 Dec. P applied: 9 Dec. FYM applied, ploughed: 13 Dec. Spring-tine cultivated twice, seed sown: 7 Feb, 1989. N applied: 31 Mar. Remaining weedkillers applied: 9 May. Fungicides applied: 9 June. Combine harvested: 1 Aug.

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MAIN PLOTS

GRAIN TONNES/HECTARE

***** Tables of means *****

| N | 0 | 48 | 96 | 144 | Mean |
|---------------|------|------|------|------|------|
| MANURE | | | | | |
| --- | 0.21 | 0.60 | 0.24 | 1.18 | 0.56 |
| -P- | 1.27 | 2.73 | 2.23 | 2.75 | 2.25 |
| --K | 0.25 | 0.35 | 0.78 | 1.20 | 0.64 |
| -PK | 1.77 | 3.01 | 3.90 | 3.03 | 2.93 |
| A-- | 0.18 | 1.06 | 0.89 | 0.63 | 0.69 |
| AP- | 1.40 | 1.38 | 1.46 | 1.73 | 1.49 |
| A-K | 0.45 | 0.92 | 1.09 | 0.91 | 0.84 |
| APK | 1.82 | 2.94 | 4.90 | 3.48 | 3.28 |
| N---- | 0.45 | 1.09 | 1.15 | 1.02 | 0.93 |
| NP--- | 1.73 | 2.11 | 2.69 | 2.70 | 2.31 |
| N-K-- | 0.19 | 0.81 | 1.08 | 1.93 | 1.00 |
| NPK-- | 2.02 | 3.12 | 3.59 | 3.48 | 3.05 |
| N--S- | 1.01 | 0.57 | 0.63 | 1.02 | 0.81 |
| NP-S- | 1.53 | 2.70 | 2.75 | 2.69 | 2.42 |
| N-KS- | 0.95 | 1.79 | 2.18 | 1.64 | 1.64 |
| NPKS- | 2.00 | 3.41 | 4.62 | 3.95 | 3.50 |
| N---S | 0.89 | 1.53 | 1.15 | 1.15 | 1.18 |
| NP--S | 1.54 | 2.35 | 2.63 | 3.07 | 2.40 |
| N-K-S | 1.14 | 1.81 | 1.33 | 1.83 | 1.53 |
| NPK-S | 1.92 | 2.58 | 4.36 | 3.23 | 3.02 |
| N--SS | 0.45 | 1.34 | 1.15 | 1.40 | 1.08 |
| NP-SS | 1.27 | 2.75 | 2.04 | 3.65 | 2.43 |
| N-KSS | 1.46 | 1.51 | 2.02 | 2.09 | 1.77 |
| NPKSS | 1.48 | 3.32 | 3.94 | 3.55 | 3.07 |
| C(--) | 1.10 | 1.77 | 1.94 | 2.01 | 1.71 |
| C(P-) | 1.48 | 2.27 | 2.77 | 2.87 | 2.35 |
| C(-K) | 1.28 | 2.19 | 2.29 | 2.66 | 2.11 |
| C(PK) | 1.70 | 2.99 | 3.42 | 3.55 | 2.91 |
| D | 4.60 | 4.56 | 4.91 | 4.56 | 4.66 |
| (D) | 1.23 | 1.98 | 1.76 | 3.23 | 2.05 |
| (A) | 0.91 | 1.10 | 1.52 | 1.28 | 1.20 |
| - | 0.66 | 1.08 | 0.90 | 0.94 | 0.90 |
| Mean | 1.26 | 1.99 | 2.26 | 2.33 | 1.96 |

GRAIN MEAN DM% 84.0

89/R/HB/2

MAIN PLOTS

STRAW TONNES/HECTARE

***** Tables of means *****

| N | 0 | 48 | 96 | 144 | Mean |
|---------------|------|------|------|------|------|
| MANURE | | | | | |
| --- | 0.07 | 0.22 | 0.11 | 0.39 | 0.20 |
| -P- | 0.41 | 0.66 | 0.62 | 0.65 | 0.59 |
| --K | 0.11 | 0.07 | 0.21 | 0.42 | 0.20 |
| -PK | 0.39 | 0.76 | 1.23 | 1.06 | 0.86 |
| A-- | 0.07 | 0.26 | 0.26 | 0.26 | 0.21 |
| AP- | 0.37 | 0.55 | 0.45 | 0.48 | 0.46 |
| A-K | 0.21 | 0.31 | 0.33 | 0.37 | 0.31 |
| APK | 0.54 | 0.98 | 1.50 | 1.51 | 1.13 |
| D | 1.78 | 2.00 | 2.32 | 2.14 | 2.06 |
| (D) | 0.29 | 0.61 | 0.53 | 1.16 | 0.65 |
| (A) | 0.28 | 0.34 | 0.45 | 0.44 | 0.38 |
| - | 0.19 | 0.33 | 0.29 | 0.33 | 0.28 |
| Mean | 0.39 | 0.59 | 0.69 | 0.77 | 0.53 |

STRAW MEAN DM% 85.5

PLOT AREA HARVESTED 0.00154

EXTRA PLOTS

GRAIN TONNES/HECTARE

***** Tables of means *****

| MANURE | 551AN2PK | 561--PK | 571NN2-- | 581NN2-- | Mean |
|------------------|----------|---------|----------|----------|------|
| MAGNESIUM | | | | | |
| 0 | 3.54 | 0.27 | 2.01 | 0.75 | 1.64 |
| 35 | 4.42 | 0.30 | 1.60 | 0.95 | 1.82 |
| Mean | 3.98 | 0.28 | 1.81 | 0.85 | 1.73 |

GRAIN MEAN DM% 83.7

PLOT AREA HARVESTED 0.00329