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Numerical Results of the Field Experiments 1970

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70/R/M/4 and 70/W/M/4 Mixed Crops Ammonium Phosphates for Grass and Barley

Rothamsted Research

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MIXED CROPS

(70/R/M/4 and 70/W/M/4)

Ammonium phosphates for grass and barley, Rothamsted (R) West Barnfield II and Woburn (W) Stackyard Series B sideland, 1970.

Design (each field):-

Ryegrass: 3 randomised blocks of 16 plots.
Barley: 3 randomised blocks of 12 plots.

Area of each plot:

Ryegrass: 0.0010. Area harvested: 0.0006.
Barley: 0.0003. Area harvested: 0.00003.

Treatments:

No fertiliser (O)
Mono-ammonium phosphate + ammonium sulphate* (A)
Mono-sodium phosphoramidate + ammonium sulphate* (M)
Sodium phosphordiamidate + ammonium sulphate* (D)
Phosphoryl triamide (T)

* To give the same N:P ratio as treatment T.

Ammonium nitrate to grass: 200 lb N in seedbed (N)
Ammonium nitrate to barley: 100 lb N West Barnfield II (R),
150 lb N Stackyard B (W) (N)

The treatments described above were applied either singly or in combinations, as shown below:-

To ryegrass: O (4 plots per block) and all combinations of:-

1. NP fertilisers: A, M, D, T.
2. Rates of fertiliser: To give 10 lb P, 13.5 lb N from NP fertiliser, plus ammonium nitrate at rate given above (1+N), to give 20 lb P, 27 lb N from NP fertiliser, plus ammonium nitrate (2+N), to give 20 lb P, 27 lb N from NP fertiliser (2).

To barley: O, N, monosodium phosphate at 10 lb P (P1) and 20 lb (P2) and all combinations of:-

1. NP fertilisers: A, M, D, T.
2. Rates of fertiliser: To give 10 lb P, 13.5 lb N from NP fertiliser, plus ammonium nitrate at rate given above (1+N), to give 20 lb P, 27 lb N from NP fertiliser, plus ammonium nitrate (2+N).

70/R&W/M/4

Basal applications:

Ryegrass: 100 lb K as potassium sulphate. Weedkiller: Mecoprop ('Clovotox' at 4 pints in 45 gals).
Barley: 50 lb K as potassium sulphate.

Cultivations, etc.:-

West Barnfield II (R): Ploughed: 29 Sept, 1969.

Ryegrass: Treatment fertilisers and basal K applied: 2 Apr, 1970.
Seed drilled at 30 lb: 17 Apr. Weedkiller applied: 29 May.
Cut twice: 5 Aug and 16 Sept. Variety: S22 Italian.

Barley: Treatment fertilisers and basal K applied: 2 Apr, 1970.
Seed drilled at 150 lb: 16 Apr. Cut green: 10 and 29 June (separate areas). Variety: Julia. Previous crops: Barley 1968 and 1969.

Stackyard B (W): Ploughed: 19 Nov, 1969.

Ryegrass: Treatment fertilisers and basal K applied: 3 Apr, 1970.
Seed drilled at 30 lb: 7 Apr. Weedkiller applied: 29 May.
Cut twice: 22 July and 17 Sept. Variety: S22 Italian.

Barley: Treatment fertilisers and basal K applied: 3 Apr, 1970.
Seed drilled at 150 lb: 7 Apr. Cut green: 3 and 24 June (separate areas). Variety: Julia. Previous crops: Fallow 1968 and 1969.

NOTE: Crop samples were taken for determination of dry matter and N %.

Standard errors per plot.

Ryegrass, dry matter, cwt:

West Barnfield II (R): 1st cut: 1.36 or 13.5% (22 d.f.)
2nd cut: 1.44 or 8.7% (22 d.f.)
Total of 2 cuts: 2.08 or 7.9% (22 d.f.)

Stackyard B (W): 1st cut: 2.08 or 19.2% (22 d.f.)
2nd cut: 2.20 or 13.0% (22 d.f.)
Total of 2 cuts: 3.62 or 13.0% (22 d.f.)

Barley, green crop, dry matter, cwt:

West Barnfield II (R): 1st cut: 2.53 or 19.2% (18 d.f.)
2nd cut: 5.88 or 15.7% (18 d.f.)

Stackyard B (W): 1st cut: 5.17 or 21.0% (18 d.f.)
2nd cut: 6.04 or 10.5% (18 d.f.)

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SUMMARY OF RESULTS

RYEGRASS

DRY MATTER: CWT

WEST BARNFIELD II (R)

	A	M	D	T	Mean
1ST CUT					
(±0.78)					
1+N	12.1	9.7	10.8	11.3	11.0
2+N	9.7	11.1	13.3	10.3	11.1
2	7.8	8.3	9.0	7.2	8.1
Mean (±0.45)	9.8	9.7	11.0	9.6	10.0

O: 5.5

General mean: 8.9

Mean D.M. %: 35.1

	A	M	D	T	Mean
2ND CUT					
(±0.83)					
1+N	17.6	19.4	19.3	18.0	18.6
2+N	16.9	18.1	18.5	17.7	17.8
2	13.3	12.9	13.4	12.3	13.0
Mean (±0.48)	15.9	16.8	17.1	16.0	16.5

O: 10.4

General mean: 14.9

Mean D.M. %: 23.0

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RYEGRASS

DRY MATTER: CWT

WEST BARNFIELD II (R)

TOTAL OF 2 CUTS

	A	M	D	T	Mean
		(±1.20)			(±0.60)
1+N	29.7	29.1	30.1	29.3	29.6
2+N	26.6	29.2	31.8	28.0	28.9
2	21.1	21.2	22.4	19.5	21.0
Mean (±0.69)	25.8	26.5	28.1	25.6	26.5

O: 15.9

General mean: 23.9

Mean D.M. %: 29.0

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RYEGRASS

DRY MATTER: CWT

STACKYARD B (W)

	A	M	D	T	Mean
1ST CUT					
(±1.20)					
1+N	15.2	14.4	12.5	14.7	14.2
2+N	12.5	13.6	15.1	14.6	13.9
2	4.5	4.1	5.4	3.6	4.4
Mean (±0.69)	10.7	10.7	11.0	11.0	10.8

O: 1.1

General mean: 8.4

Mean D.M. %: 31.1

	A	M	D	T	Mean
2ND CUT					
(±1.27)					
1+N	22.0	20.2	19.2	23.6	21.2
2+N	21.5	21.3	21.7	22.3	21.7
2	7.5	8.4	9.1	6.9	8.0
Mean (±0.73)	17.0	16.6	16.7	17.6	17.0

O: 5.1

General mean: 14.0

Mean D.M. %: 32.8

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RYEGRASS

DRY MATTER: CWT

STACKYARD B (W)

TOTAL OF 2 CUTS

	A	M	D	T	Mean
			(±2.09)		(±1.04)
1+N	37.2	34.6	31.7	38.3	35.4
2+N	34.0	34.9	36.8	36.9	35.6
2	12.0	12.6	14.5	10.5	12.4
Mean (±1.21)	27.7	27.4	27.7	28.6	27.8

O: 6.3

General mean: 22.4

Mean D.M. %: 32.0

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BARLEY

GREEN CROP, DRY MATTER: CWT

WEST BARNFIELD II (R)

	P*	A	M	D	T	Mean
1ST CUT						
	(±1.46)					(±0.65)
1+N	9.9	10.9	12.2	13.7	14.0	12.1
2+N	10.9	16.5	13.3	16.1	14.7	14.3
Mean (±1.03)	10.4	13.7	12.7	14.9	14.4	13.2
O:	6.5					
N:	10.8					
General mean:	12.5					
2ND CUT						
	(±3.39)					(±1.52)
1+N	28.2	37.7	38.5	42.8	37.2	36.9
2+N	30.7	39.4	45.1	37.6	37.7	38.1
Mean (±2.40)	29.5	38.6	41.8	40.2	37.5	37.5
O:	22.8					
N:	31.4					
General mean:	35.8					

* Did not receive N

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BARLEY

GREEN CROP, DRY MATTER: CWT

STACKYARD B (W)

	P*	A	M	D	T	Mean
1ST CUT						
			(±2.99)			(±1.34)
1+N	3.9	25.2	30.1	27.8	29.1	23.2
2+N	4.5	36.3	28.9	30.8	29.3	26.0
Mean (±2.11)	4.2	30.8	29.5	29.3	29.2	24.6
C:	4.9					
N:	27.0					
General mean:	23.2					
2ND CUT						
			(±3.49)			(±1.56)
1+N	13.3	67.6	72.0	69.6	62.7	57.0
2+N	12.0	68.6	72.0	64.9	71.1	57.7
Mean (±2.47)	12.7	68.1	72.0	67.2	66.9	57.4
C:	13.6					
N:	66.8					
General mean:	53.6					
* Did not receive N						