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## Report for 1930

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### Seeds Hay

#### Rothamsted Research

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TABLE VIII.—Yield and composition of mixed crops grown for fodder and cut as hay.

Nitrogen added in manure, cwt. per acre.	0	0.2	0.4
Yield of dry matter, cwt. per acre—			
Oats—Vetches .. .. .	21.9	32.1	32.4
Oats—Peas .. .. .	26.0	31.3	34.1
Barley—Vetches .. .. .	27.3	30.7	37.6
Barley—Peas .. .. .	26.1	33.0	38.9
Mean .. .. .	25.3	31.8	35.8
Percentage composition of dry matter of all mixture—			
Protein .. .. .	11.7	9.6	8.6
Soluble carbohydrates .. .. .	46.2	48.8	49.1
Crude Fibre .. .. .	32.9	32.5	33.4
Oil .. .. .	2.4	2.6	2.5
Ash .. .. .	6.8	6.5	6.4
Percentage by weight of leguminous plants in hay .. .. .			
Leguminous plants, cwt. of dry matter per acre .. .. .	41	27	20
Cereals, cwt. of dry matter per acre ..	10.3	8.7	7.2
Nitrogen in crop cwt. per acre .. .. .	15.1	23.1	28.6
	0.42	0.44	0.44

*Composition of Meadow Hay (T. B. Wood).*

	Very good	Good	Poor.
Protein .. .. .	16.1	11.3	8.8
Soluble carbohydrates .. .. .	48.2	47.9	44.6
Crude Fibre .. .. .	23.0	30.7	39.1
Oil .. .. .	3.6	2.9	1.8
Ash .. .. .	9.2	7.2	5.8

In yield of grain the barley mixtures responded somewhat to potassic fertilisers, but the oat mixtures did not, and there was little if any response to superphosphate. Different combinations of manures are being tested this season; there is clearly much to be learned about the manuring of these important crops.

A second forage mixture of rye, beans and vetches in Pastures Field cut as hay gave substantial increases, up to 20 cwt. per acre but not beyond, to sulphate of ammonia, and increases up to 10 cwt. per acre but not beyond, to potash. There were no increases, however, to phosphate. The yields were, in cwt. of hay per acre:

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Varying Nutrient.	Hay : cwt. per acre Doses of Nutrient.				
	0	1	2	3	4
Nitrogen ..	56	66	74	75	72
Phosphate ..	71	66	69	69	65
Potassium ..	59	69	68	61	64

SEEDS HAY

The "seeds ley" sown at Rothamsted is pure clover without admixture of grasses; the reason being that under our conditions of farming, the fritfly (*Oscinella (Oscinis) frit L.*) and other insects



may winter on the grasses and pass over to the cereals as soon as spring appears; they do not survive on clover, however. Usually the seeds ley receives no manure except what may be given to the barley. Our general experience has been that a dressing of sulphate of ammonia may depress the clover while potash may help it. In the Long Hoos experiment (Rotation II) fertiliser is given to the clover itself as a top dressing in spring, and here quite a different result was obtained; nitrogen greatly increased the yield, potash slightly increased it, but phosphate had no effect. The yields of dry matter were, in cwt. per acre:

Rothamsted heavy soil.

Varying Nutrient.	Dry matter cwt. per acre Doses of Nutrient.				
	0	1	2	3	4
Nitrogen ..	22	33	34	42	47
Phosphate ..	36	35	36	36	39
Potassium ..	33	37	36	37	36

To convert these figures into hay they should be raised by about one-fifth.

In another experiment on Hoos Field the unmanured clover yielded 12 cwt. dry matter per acre (equal to about 15 cwt. hay), while a dressing of superphosphate, muriate of potash, and 2 cwt. sulphate of ammonia raised it to 22 cwt. dry matter or about 26 cwt. hay and heavier dressings yielded as much as 42 cwt. dry matter or 50 cwt. hay per acre.

Evidently if ever hay were needed there would be great scope for manuring the seeds ley.

These results appear to be contradictory to those given by the earlier experiments where the manuring was given to the barley. There is, however, no contradiction. A mixture of barley and clover responds very differently from pure barley or pure clover to manures. Sulphate of ammonia favours the barley more than it does the clover, so causing the young barley to make more vigorous growth and to crowd out the clover. With the pure clover this element of competition is absent, and so long as the crop is not too weedy there seems the possibility that it could advantageously receive nitrogenous manure. Possibly there would be less fixation of nitrogen from a manured crop than from one receiving no nitrogen, but in these days of cheap nitrogenous fertilisers that point is of less importance than it was.

#### EFFECTS OF FARMYARD MANURE: HOW LONG DO THEY LAST?

Two sets of experiments, one at Rothamsted and one at Woburn, give useful information on this subject. The remarkable result is the persistence of the effect when the farmyard manure has been given sufficiently often. Of three plots of barley on Hoos Field, two had farmyard manure every year from 1852 to 1871, both being treated exactly alike, the third had no manure. This unmanured plot and one of the manured plots have remained under the same