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Nitrogenous fertiliser requirements in different cropping rotations - 1979 results

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DEPARTMENT OF AGRICULTURE
Western Australia

NITROGENOUS FERTILISER REQUIREMENTS
IN DIFFERENT CROPPING ROTATIONS

1979 Results

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Research Officers

PLANT RESEARCH DIVISION

Nitrogen Requirement of Wheat After Clover, Lupins and Cereal
Chapman Research Station, Nabawa

1978 TREATMENT	1979 TREATMENT ON WHEAT	VEGETATIVE YIELD (kg/ha)	GRAIN YIELD (kg/ha)
NORTHAM CLOVER PASTURE	Nil	3919	1964
	Ammonium Nitrate 38 kg/ha	3977	1994
	" " 76 "	4166	1806
	" " 114 "	4323	1835
	" " 152 "	4283	1756
	" " 228 "	4673	1756
UNICROP LUPINS	Nil	3879	1994
	Ammonium Nitrate 38 kg/ha	3967	2044
	" " 76 "	3943	2034
	" " 114 "	3948	2063
	" " 152 "	3775	2123
	" " 228 "	4163	2063
GAMENYA WHEAT	Nil	4310	2014
	Ammonium Nitrate 38 kg/ha	4515	1994
	" " 76 "	4241	2044
	" " 114 "	4355	1984
	" " 152 "	4433	2093
	" " 228 "	4795	2044
	" " 456 "	4730	2083

Soil Type: Brown sandy loam over brown clay at 40 cm +

History Prior to 1978: Old clover land.

Crop: Gamenya Wheat

Sowing Date: 26/6/79

Basal: Superphosphate 121 kg/ha.

Comments: Good crops, fairly weed free except for one of the exclover blocks which was heavily infested with Wimmera Rye Grass. The vegetative yield of the 1978 lupin crop (18/9/78) averaged 2324 kg/ha. The vegetative yield of the 1978 wheat crop at the same time averaged 2683 kg/ha. The pasture measured at this time after no grazing for 4-5 weeks averaged 2700 kg/ha and averaged 39.4% clover content. Nitrogen fertiliser topdressed immediately before sowing. Stubble from previous crops grazed and burnt.

78E3/3231Ex

Nitrogen Requirement of Barley After Clover, Lupins and Cereal
Esperance Downs Research Station, Gibson

1978 TREATMENT	1979 TREATMENT ON BARLEY	VEGETATIVE YIELD (kg/ha)	GRAIN YIELD (kg/ha)
CLOVER PASTURE	Nil	841	1424
	Ammonium Nitrate 38 kg/ha	1033	1243
	" " 76 "	1380	1652
	" " 114 "	1164	1662
	" " 152 "	1761	1600
	" " 228 "	2015	1671
	" " 456 "	2873	1738
UNICROP LUPINS	Nil	439	1138
	Ammonium Nitrate 38 kg/ha	658	948
	" " 76 "	408	938
	" " 114 "	862	1281
	" " 152 "	691	1114
	" " 228 "	1064	1352
	" " 456 "	1014	1200
WEST OATS	Nil	202	224
	Ammonium Nitrate 38 kg/ha	233	333
	" " 76 "	398	438
	" " 114 "	458	548
	" " 152 "	756	548
	" " 228 "	735	662
	" " 456 "	791	914

Soil Type: Grey sand with some gravel over gravel at 10-35 cm over clay. Gravel layer not present in a few blocks.

History Prior to 1978: Old clover land.

Crop: Clipper Barley

Sowing Date: 12/7/79

Basal: Superphosphate 120 kg/ha.

Comments: Area waterlogged. Six blocks waterlogged too badly to harvest. Other blocks thinned out by waterlogging. Not many weeds in previous clover and lupin blocks. Some Wimmera Rye grass in previous cereal blocks. The 1978 lupin crop was poor and averaged vegetatively 1133 kg/ha (2/10/78) and harvested 613 kg/ha seed. The vegetative yield of the oats was 1722 kg/ha and grain yield was 1217 kg/ha. The pasture measured on 2/10/78, after 4-5 weeks without grazing, averaged 3932 kg/ha with an average clover content of 15.8%. Nitrogen topdressed immediately before sowing. Stubble of previous crops raked off and burnt.

78N1/3231Ex

Nitrogen Requirement of Wheat After Clover, Lupins and Cereal
Newdegate Research Station

1978 TREATMENT	1979 TREATMENT ON WHEAT	VEGETATIVE YIELD (kg/ha)	GRAIN YIELD (kg/ha)
CLOVER PASTURE	Nil	602	305
	Ammonium Nitrate 38 kg/ha	916	400
	" " 76 "	967	400
	" " 114 "	1111	433
	" " 152 "	1124	483
	" " 228 "	1528	479
UNICROP LUPINS	Nil	691	483
	Ammonium Nitrate 38 kg/ha	1022	443
	" " 76 "	931	512
	" " 114 "	1230	524
	" " 152 "	1159	464
	" " 228 "	1335	512
WEST OATS	Nil	937	336
	Ammonium Nitrate 38 kg/ha	1053	357
	" " 76 "	1144	421
	" " 114 "	1426	479
	" " 152 "	1277	431
	" " 228 "	1368	533
	" " 456 "	1509	517

Soil Type: Yellow gravelly loamy sand over gravel at 10-25 cm.

History Prior to 1978: 1974-75 - Barley crop. 1976-77 - Daliak Subclover. Stubble of 1978 crops grazed.

Crop: Gamenya Wheat

Sowing Date: 18/6/79

Basal: Superphosphate 180 kg/ha.

Comments: Some Wimmera Rye Grass in patches in the plots. The 1978 lupin crop was very poor and vegetative yield at 3/10/78 was only 680 kg/ha average, but the blocks ranged from 173 to 1784 kg/ha. The 1978 oats crop was severely infested with Wimmera Rye Grass and the combined vegetative dry matter of oats and ryegrass averaged 1590 kg/ha. The pasture, which was Daliak subclover planted in 1978 at 50 kg/ha to supplement the existing poor pasture, produced an average of 1468 kg/ha dry matter. The nitrogen fertiliser was topdressed immediately before sowing. The stubble of the previous crops was grazed and burnt.

78BA1/3604Ex

Nitrogen Fertiliser Requirement in Alternate Crop-Pasture Rotation
Badgingarra Research Station

Botanical Composition of Pasture Blocks (Sampled 16/9/79)

BLOCK	1978 TREATMENT	PERCENT OF TOTAL PASTURE		
		CLOVER	GRASS	WEEDS
1	Pasture	52	35	13
3	Wheat	10	38	51
4	Wheat	20	52	28
6	Wheat	17	54	29
9	Pasture	42	20	39
10	Wheat	13	28	59

1979 Crop Blocks

TREATMENT	VEGETATIVE YIELD (16/9/79)(kg/ha)	GRAIN YIELD (kg/ha)
Nil	2137	2052
Ammonium Nitrate 38 kg/ha	2476	2188
" " 76 "	3309	2481
" " 114 "	3329	2524
" " 152 "	3846	2700
" " 228 "	4217	2560
" " 456 "	4482	2529

Soil Type: Grey gravelly sand over gravel at about 15-20 cm.

History: Old clover land. All wheat blocks are sown as first crops after clover pasture.

Crop: Gamenya Wheat.

Sowing Date: 15/6/79

Basal: Superphosphate 90 kg/ha on both crop and pasture.

Comments: A little Wimmera Rye Grass in plots. A fair amount of leaf Septoria in the wheat. The ammonium nitrate was topdressed immediately before sowing. There was a visual residual nitrogen effect in the pastures following last year's crops, particularly where the high rates of ammonium nitrate were used.

78WH2/3604Ex

Nitrogen Fertiliser Requirement in Alternate Crop-Pasture Rotation
Wongan Hills Research Station

Pasture Blocks (Sampled 3/9/79)

BLOCK	1978 TREATMENT	PERCENT OF TOTAL PASTURE			TOTAL DRY MATTER (kg/ha)
		CLOVER	GRASS	WEEDS	
1	Pasture	47	43	10	2120
3	Wheat	74	16	10	1392
4	Wheat	78	8	14	1928
6	Wheat	63	18	19	1704
9	Pasture	28	59	14	2320
10	Wheat	71	15	14	1776

1979 Crop Blocks

TREATMENT	VEG. YIELD (17/9/79) (kg/ha)	GRAIN YIELD (kg/ha)
Nil	2709	1071
Ammonium Nitrate 35 kg/ha	2802	1024
" " 81 "	3042	943
" " 114 "	3380	955
" " 153 "	3222	1021
" " 215 "	3201	955
" " 435 "	3663	812

Soil Type: Wongan yellow loamy sand.

History: Old clover land. All wheat blocks are sown as first crops after clover pasture.

Crop: Gamenya Wheat

Sowing Date: 13/6/79

Basal: Superphosphate 112 kg/ha on both crop and pasture.

Comments: A fair amount of Wimmera Rye Grass and Barley grass in the plots. The ammonium nitrate was topdressed immediately before sowing. Nungarin subclover scratched in dry at 55 kg/ha on pasture blocks.