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DEPARTMENT OF AGRICULTURE

Western Australia

SUMMARY OF EXPERIMENTAL RESULTS 1978

LONG TERM ROTATION TRIALS

66M29
67C13
67N4
68E5
68SG5
73SG16

I. ROWLAND
PLANT RESEARCH DIVISION

66M29/2083EXLocality: Paddock 5AE on Merredin Res. Stn.Soil type: Merredin sandy clay loam.History

An old land site, cleared in 1909. First sown to Cyprus Barrel medica in 1955, grazed and topdressed. Cropped 1962 and 1964. Medic resown in 1965. In the last few years the medic component of the pasture has disappeared and the pasture is dominated by ryegrass and barley grass. The proportion of the latter increases with age of the pasture.

Rainfall: in mm.

May	June	July	Aug	Sept	Oct	Total
16.6	29.8	76.7	13.3	27.7	16.6	180.7

Wheat Yields: Madden sown on 27.6.78

Rotation	Crop	kg grain/ha
Control	13th	266
1 crop : 1 pasture	1	110
1 crop : 2 pasture	1	526
1 crop : 4 pasture	1	325
2 crop : 2 pasture	1st	89
	2nd	470
2 crop : 4 pasture	1st	188
	2nd	187
3 crop : 3 pasture	1st	268
	2nd	397
	3rd	405

Crops were again (4th successive year) very poor due to lack of finishing rains. The 1:1 rotation was weedier (phalaris and wild oats) than most other plots except the 1st crop in a 2:2 rotation which was choked by wild oats for no logical reason.

Good rain at the end of Feb. (86 mm) gave a good germination of Cyprus medic and plots which in 1976 had virtually no medic have recovered due to heavy grazing control of the barley grass.

67C13/2332EXLocality: Paddock 19B on Chapman Res. Stn. (Nabawa)Soil type: Red brown loamy sand.History

An old land site, cleared in 1903. Sown to Dwalganup sub clover in 1964, topdressed each year until the start of the trial in 1967.

Rainfall; in mm.

May	June	July	Aug	Sept	Oct	Total
40.2	98.4	147.2	44.5	50.0	18.6	398.9

Wheat Yields: Gamenya sown on 3.7.78

Rotation	Crop	kg grain/ha
Control	1 st th	1187
1 crop : 1 pasture	1	1992
1 crop : 2 pasture	1	1771*
1 crop : 4 pasture	1	2189
2 crop : 2 pasture	1st	1973
	2nd	1933
2 crop : 4 pasture	1st	2190
	2nd	2163
3 crop : 3 pasture	1st	2134
	2nd	2058
	3rd	1663*

* Centre of these plots was waterlogged.

Rotation did not greatly effect the grain yield in 1978. The two previous dry years gave crops which would not have removed much nitrogen from the soil thus helping prevent any drop in yield of second or third crops. Waterlogging is a site effect and not involved with rotations.

removed by the Hoegrass on 28.7.78.

3. The continuous lupins (5th crop) had very little observable diseased plants. Annual ryegrass was bad but controlled by Hoegrass.
4. Wheat was substituted for barley because previous barley crops in 1976 and 1977 were showing no response to length of legume or to use of lupins before the cereal for disease control. It is hoped that "takeall" will start building up to see if a year of lupins can act as a "cleaning crop" for wheat. In October it was observed that wheat straight after clover had noticeable numbers of "takeall" affected plants. This trend also is evident in the final grain yields.
5. Over the last three seasons a lupin:cereal rotation has given yields of each, comparable with the larger rotations which are spelled to pasture. Yields of approx 1.2 t for lupins and 2.2 t for cereal. It must be kept in mind though that the site does not seem to have a serious disease problem for lupins and that 1978 was the first wheat year. More seasons are needed to see if a years lupins can control "takeall". Further the lupin:cereal rotation is dependent on "Hoegrass" for control of annual ryegrass which otherwise builds up rapidly in such a continuous crop system.

65SG5/2475EXLocality: Paddock H5 on Salmon Gums Res. Stn.Soil type: Complex of Kumarl loam (heavy) and Circle Valley/Beete calcareous sandy loam (lighter).History

Cleared in 1962, then cropped until the start of the trial in 1968. Two of the four blocks were sown to Cyprus Barrel medic which is topdressed with superphosphate. The other two blocks regenerate volunteer pasture which is not topdressed.

Rainfall: in mm.

May	June	July	Aug	Sept	Oct	Total
29.6	35.3	55.7	12.7	48.8	7.6	189.7

Wheat Yields: Madden sown on 1.6.78
Treflan used.

15th crop - No. N fert. 1021 kg grain/ha.
15th crop - + 54 kg Agran 34/ha 795

			PASTURE	
			Medic	Volunt.
1 crop	: 1 year pasture	1st crop	1266	1432
1 crop	: 3 year pasture	1st crop	1291	1892
3 crop	: 3 year pasture	1st crop	1309	1750
		2nd crop	1062	1203
		3rd crop	811	1024

Nitrogen, either as fertilizer or from the medic pasture resulted in a yield decrease due to these plots "haying off". The 1:1 rotations had more ryegrass than other treatments (except the continuous crop).

Some "takeall" was present in all second and third crops.