1969

Long Term Rotation Trials

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1969 RESULTS OF FIELD EXPERIMENTS

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LONG TERM ROTATION TRIALS

The object of these trials is to attempt to determine the best rotation for each area or at least give some guide-lines for recommendations as to the optimum rotation. Also to determine the effect of various pasture phases on the performance of the following crops and the number of crops required to utilise any accrued benefit from the pasture.

In addition the trials on the Salmon Gums Research Station (68SG5) will attempt to compare cereal rotations on both volunteer and barrel medic pastures. It is also hoped to be able to get some estimate of grazing production from barrel medic and volunteer pastures.

The trial being run by the Geraldton District Office at Northampton (68GE8) will determine the best rotation for soil badly infected with cereal eelworm. Also find the effect of various lengths of pasture and fallow on the level of eelworm in the soil. The eelworm work is being carried out by Miss Goss of Plant Pathology.

HISTORY;
/ SOIL TYPES & VEGETATION:

W 56 H : Pdk 3E on Wongan Hills Res. Stn.
Virgin Site.
Wongan sandy loam.
Smoke bush, wattle, low scrub & isolated mallee patches.

66M 29 : Pdk 5AE on Merredin Research Station.
Old land, cropped 1962 to 1964, sown to barrel medic in 1965.
Sandy clay loam.
Salmon Gum and Gimlet.

67BA 6 : Pdk 7 on Badgingarra Research Station.
Virgin site.
Sand over gravel at 2 - 8 inches.
Low native scrub.

67C 13 : Old land, subclover/pasture since 1964.
Red brown loamy sand.
Standback, Jam & York Gum.

67 N 4 : Experimental pdk on Newdegate Res. Stn.
Old land, sown to subclover in 1962.
Sandy soil over gravel at 8-12 inches.
Mallee scrub.

68 E 5 : Pdk N16 on Esperance Downs Res. Stn.
Old land, Woogenellup & Brome grass sown in 1963.
Fleming gravelly sand.
Chittick and mallee.

68SG 5 : Pdk H5 on Salmon Gums Res. Stn.
Old land, cropped since 1964.
Northern two blocks are on Circle Valley sand, the Southern two on Kumarl.
Mallee and medium eucalypts with teatree undergrowth.

TREATMENTS:

W 56 H :

2 years clover followed by 1, 2, 3 & 4 years wheat
3 " " " " " " "
5 " " " " " " "
7 " " " " " " "

66M29: 67BA6: 67C13: 67N4:

1. Crop continuously	(2 reps each year -	2 plots)
2. Pasture	(2 " " " -	2 ")
3. 1 year crop after 1 years pasture	(2 " " " -	4 plots)
4. 1 year crop after 2 years pasture	(1 rep each year -	3 plots)
5. 1 year crop after 4 years pasture	(1 rep each year -	5 plots)
6. 2 year crop after 2 years pasture	(1 rep each year -	4 plots)
7. 2 year crop after 4 years pasture	(1 rep each year -	6 plots)
8. 3 year crop after 3 years pasture	(1 rep each year -	7 plots)

68E5:

1. Continuous wheat	(2 reps each year -	2 plots)
2. " linseed	(2 reps each year -	2 plots)
3. " pasture	(2 reps each year -	2 plots)
4. 1 year wheat after 1 year pasture	(1 reps each year -	2 plots)
5. 1 year linseed after 1 year pasture	(1 reps each year -	2 plots)
6. 1 year wheat after 2 year pasture	(1 reps each year -	3 plots)
7. 1 year linseed after 2 year pasture	(1 reps each year -	3 plots)
8. 1 year linseed after 1 year pasture	(1 reps each year -	4 plots)
9. 1 year linseed after 1 year pasture	(1 reps each year -	6 plots)
10. 1 year wheat after 4 year pasture	(1 reps each year -	5 plots)

68SG5:

1. Continuous wheat in Cyprus	(Medic system	(4 plots)
2. 1 year crop after 1 year Cyprus	(4 reps each year -	8 plots
3. 1 year crop after 3 year Cyprus	(2 reps each year -	8 plots
4. 3 year crop after 3 year Cyprus	(2 reps each year -	12 plots
5. Continuous wheat in Volunteer pasture system (4 plots)		
6. 1 year crop after 1 year Volunteer	(4 reps each year -	8 plots)
7. 1 year crop after 1 year Volunteer	(2 reps each year -	8 plots)
8. 3 year crop after 3 year Volunteer	(2 reps each year -	12 plots)

68GE8:

1. Crop continuously	(2 reps each year -	2 plots)
2. 1 year crop after 1 year pasture	(1 reps each year -	2 plots)
3. 1 year fallow, 1 year crop, 1 year pasture	(1 reps each year -	3 plots)
4. 1 year crop after 2 year pasture	(1 reps each year -	3 plots)
5. 1 year crop after 4 year pasture	(1 reps each year -	5 plots)
6. 2 year crop after 2 year pasture	(1 reps each year -	4 plots)
7. 1 year fallow, 2 year crop, 2 year pasture	(1 reps each year -	5 plots)

HARVEST YIELDS (Bushels/acre) FOR 1969:

W56H:

	1st	2nd	3rd	4th	Crops
Years clover 2	19.7	14.8	14.7	16.7	
3	19.6	16.2	17.1	18.3	
5	22.9	18.9	21.7	18.5	
7	23.1	17.3	19.8	19.4	
2nd crop after fallow				11.9	

The corresponding nitrogen levels, in lbs N/acre 3", from the plots before the 1969 crop was sown (i.e. from 1968 treatment) are:-

420	320	310	360
390	420	340	360
490	410	500	430
640	460	460	450

280 lbs N/ac 3"

This is total N in the top 3" calculated from samples taken in March and including any coarse organic matter. The low N results for 3 and 5 years clover may have been caused by the poor initial planting, in 1966 and 1964 respectively, of these clovers. The 1969 yield for 1 crop after 3 years clover reflect the low N value after 3 years clover; however, that from 1 crop after 5 years clover does not.

66M29:

Stage of rotation	Yield	N lbs/ac 3"
4 successive crops	2.4	85
1 crop after 1 year barrel medic	2.2	93
3 " " 1 " " "	1.7	
1 " " 2 " " "	3.3	91
2 " " 3 " " "	2.4	
1 " " 4 " " "	3.8	

Stage of rotation has been altered to allow for 1 year of pasture before the trial started. Drought badly affected all plots. There was a response to 2 years and over of barrel medic, by the first crop. Nitrogen levels are for the less than 2 mm fraction of the top 3" sampled in March.

67BA6:

Stage of rotation	
1st crop	11.0
3rd crop	16.8

The 1st crop is an initial clearing crop on virgin land, before being sown to pasture. The continuous crop shows the effect of more thorough cultivation and a cleaner seedbed.

67C13:

Stage of rotation	
3rd crop	9.0
1st crop after 1 year clover	12.9
2nd " " 4 " "	7.2
1st " " 5 " "	12.6

Stage of rotation altered to allow for 3 years previous pasture.

67N4:

Stage of rotation	
3rd crop	19.7
1st crop after 1 year clover	25.4
2nd " " 6 " "	20.8
1st " " 7 " "	22.4

Stage of rotation altered to allow for 5 years previous pasture.

68E5:

Stage of rotation	
2nd wheatcrop	29.2
1st crop after 1 year linseed	35.1
1st " " 6 year clover	32.9
2nd linseed crop	3.9
1st crop after 6 year clover	4.1

Stage of rotation altered to allow for 5 years previous pasture. Linseed yields decreased by cutworm damage and the dry conditions at flowering.

68SG5:

Stage of rotation	
6th crop	2.6
1st crop after 1 year volunteer	3.1
1st " " 1 " barrel medic	2.6

Stage of rotation altered to allow for 4 years of crop prior to commencement of the trial. Drought had badly affected all of the plots. Barrel medic sown in 1968 never established and the lack of pasture and the extra working the soil received possibly accounts for the lack of response to a year of improved pasture.

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IR:EH.