1975

Summary of trial results - 1975

N. R. McKeown

DEPARTMENT OF AGRICULTURE

WESTERN AUSTRALIA

SUMMARY OF TRIAL RESULTS - 1975

N.R. McKeown - Research Officer

Plant Research Division

(February 1976)

1.0.0. Trials in Progress

In 1975 all but one of the five low oestrogen cultivar trials had been formally terminated although two others were inspected to determine the conditions of the pastures. The three grazing trials evaluating either Tornafield medic or serradella, and the barrel medic trial at Lake Grace, were all sown to wheat. The 34 hectare grazing management trial at West Moora was completely resown to subterranean and rose clovers, serradella and lucerne in the early winter. This latter project with the associated replacement and modification of its fencing and watering system more than compensated for the reduction in work on other experiments. None of the grazing trials were grazed in 1975.

Of the 11 small-plot legume species trials only 4 were continued into 1975 but 7 new trials were established. Two of the new trials were conducted in collaboration with Dr. Francis. One aimed primarily at further testing of the new early-maturing subterranean clover crossbreds at Lake King, and the second at Salmon Gums, sought to compare the production of a selection of T. subterraneum brachycalycinum with the medics which grow well in this area.

Two trials featured the new Medicago tornata strain, Murrayland, with Tornafield and Harbinger medics as controls; two more were established to indicate suitable legume varieties for soils susceptible to domination by annual ryegrass at east Katanning, and the seventh was planned to indicate the suitability of new strains of sub. clover to replace Dwalganup at Newdegate. The results of these trials will be reported later.

This report summarizes the results from the grazing trials under the following headings:-

2.0.0. Seasonal Conditions

3.0.0. Grazing Experiments

3.1.0. 68MO23 - Legume Grazing Management Trial, West Moora

3.2.0. 71LG17 - Comparison of Production from Cyprus Medic and Volunteer Pasture

3.3.0. Tornafield Medic, Serradella and Subterranean Clover Comparisons

3.3.1	70ME2	-	Walgoolan
3.3.2	71WH13	-	Wongan Hills
3.3.3	69LG24	-	Lake Grace

.../2

3.4.0. Low Oestrogen Legume Grazing Trials

3.4.1. 68TS12 - Eneabba

2.0.0. Seasonal Conditions

In most of the agricultural areas the growing season opened in April. Following rains in May and June were generally less than average, but sufficient to keep pastures moving forward. July rain was better than average, but August rain varied from normal in some districts to critically short in others. Moora received about half the average rainfall in this month and at one stage it was extremely doubtful whether the annual clovers would set seed. Wongan Hills was in a similar position but Walgoolan received average rainfall for the month. Average to good rains in September and October in most areas ensured good seeding of pastures, and legumes capable of continued growth such as rose clover and serradella showed up particularly well.

3.0.0. Grazing Experiments

3.1.0. 68M023 - Legume Species Grazing Management Trial

Locality: R. Isbister, West Moora

Soil Type: Deep yellow sand

History: Original vegetation dominated by blackbutt.
No cultivation before establishment of trial.

Fertiliser: 1,698 kg superphosphate a hectare plus trace elements (including cobalt) has now been applied.

Treatments:

1968 - 1973; Pasture (sub. clover, lucerne, W.A. blue lupins)
1974; Wheat
1975; New pastures sown as follows:-

Treatments	Code	Grazing Management
Geraldton sub. clover	S	Continuous grazing
Hunter River lucerne	L	4 - paddock rotation
Geraldton - lucerne mixture	SLM	4 - paddock rotation
Geraldton 75% : lucerne 25%	S/L$\frac{1}{4}$	2 - paddock strategic
Geraldton 50% + lucerne 50%	S/L$\frac{1}{2}$	2 - paddock strategic
Geraldton 50% + Kondinin rose clover 50%	S/R$\frac{1}{2}$	2 - paddock deferred spring
Geraldton 50% + serradella 50%	S/Se$\frac{1}{2}$	2 - paddock deferred spring

.../3

The treatments were sown in duplicate randomized plots and each treatment is 4.54 hectares. When the pastures are well established it is proposed to stock them at 4.9, 5.9 and 7.4 wethers a hectare.

Pasture Establishment

The continuously grazed Geraldton clover plots were sampled at the end of March 1975 and gave seed yields ranging from 27 to 132 kg/ha (mean, 86.2 kg/ha). Originally any subterranean clover treatments which were to be continued were not to be resown. However, with good rains and a general germination early in April, most of the early germinating clover was killed by the first cultivation later in the month. A second germination of clover, plus a healthy growth of capeweed and ryegrass was killed by a second cultivation about May 14. As these cultivations had been preceded by the complete destruction of a dense stand of clover in June 1974 (to sow wheat) it was deemed necessary to reseed all the Geraldton treatments in 1975.

The rates of fertilizer and seed actually sown (kg/ha) are shown below:-

Treatment	Sub. Clover	Lucerne	Clover Luc. Mix	Rose Clover	Serradella
Superphosphate	160	160	160	160	160
Ground limestone		160	160		
Seed:					
Clover	25		5	20	
Lucerne		4.5	4.5		
Fitman's serradella					10
Uniserra serradella					10

All seed was inoculated, lime pelleted and thoroughly mixed with the fertilizer immediately before sowing.

The experiment was harrowed on May 19 and 20, and seeded with a 12 run drill between May 21 and 28. It was treated with 1 litre/ha 25% D.D.T. on May 29 as protection against red-legged earthmite.

Planting conditions were very good. Rain fell during and after seeding and gave a good germination of all treatments.

.../4

Seedling Density, 9/7/75

Treatments	Cultivar (plants/dm^2)			
	Geraldton	Lucerne	Rose cl.	Serradella
Sub. clover (S)	2.31			
Lucerne (L)		0.96		
Sub. clover - Luc. mixture (SLM)	1.13	0.54		
Sub. cl. + Luc. 25% (S/L¼)	2.21	1.02		
Sub. cl. + Luc. 50% (S/L½)	2.21	0.77		
Sub. cl. + Rose cl. 50% (S/R½)	1.62		1.29	
Sub. cl. + Serradella 50% (S/Se½)	2.30			0.68

The mixture plots (SLM) were all sown back onto plots which had been dominantly sub. clover from 1969 to 1973 so the lower clover density shown on this treatment in the above table can be interpreted as a reflection of loss of seed since 1973 and the lower seeding rate used in 1975.

The sub. clover - rose clover treatment (S/R½) was not sown on old clover plots and therefore the 1.29 plants/dm^2 resulted from the seeding rate of 25 kg/ha in 1975.

By early June the sub. clover was well established in the drill rows but regenerating clover between the rows was sparse. Lucerne was in the three-leaf stage, healthy and free of insect damage. The rose clover also looked well but serradella plants were few and small. New Uniserra seed was unobtainable commercially for this project and seed obtained in 1972 had been used. From observations through the season it was concluded that the Uniserra had germinated poorly and most of the serradella in the plots was of the Pitman's strain.

By late July annual ryegrass and capeweed were growing vigorously. A considerable amount of lucerne had also survived from 1973 on old low stocking rate lucerne plots and required grazing. The undesirability of grazing newly sown lucerne hard in the first year; the expected disparity between treatments sown for the first time in 1975 and resown treatments, and the difficulty in refencing and re-establishing the watering system before 1976, precluded stocking with experimental sheep in 1975. As an alternative, a flock of 160 wethers belonging to Mr. Isbister were used to graze the experiments by blocks. This stocking intensity was satisfactory until late August when volunteer growth tended to get ahead of the sheep but was rarely sufficient to retard the growth of the sown species. Sheep were removed from the plots for shearing in late September and were not returned.

The August rainfall at Moora was less than half that normally received and on September 15th the sub. clover was drying rapidly without having matured seed and the rose clover and Uniserra serradella had only begun to flower. However, September finished with about two thirds more rainfall than average and useful rainscontinued into October ensuring adequate seed setting in all the annual pasture species. Lucerne seedlings were drying off generally in November but old lucerne plants were not affected.

.../5

Considerable time and effort is being spent in modifying this experiment for further grazing. The job entails the replacement of some 5 kilometres of internal fencing including the re-erection of 80 strainers; the replacement and connection of more than a kilometre of polythene water pipe in short lengths and the replacement of some 36 water troughs.

It is intended to place sheep on the plots at less than the planned maximum rates in the Autumn of 1976.

3.2.0. 71LG17 - Comparison of Production from Cyprus Barrel Medic and Volunteer Pasture

Locality: H. Marshall, Lake Grace

Soil Type: Red-brown loam overlying clay at 10 - 15 cms., originally carrying salmon gum.

History: Not available before 1966. 1966 to 1970 inclusive, Legume Species Grazing Trial, No. 66LG11. Sown to barley in 1970.

Fertilizer: 706 kg/ha superphosphate applied from 1966 to 1970 inclusive.

Treatments:
1. Cyprus barrel medic.
2. Volunteer pasture mainly woolly clover, T. tomentosum and barley grass, Hordeum leporinum.

Sub-treatments: Superphosphate 101 kg/ha
" Nil
Plot size 1.2, 1.6, 1.8 and 2.4 hectares.
Two replications.

Stocking Rates: 3.7, 5.8 and 7.4 wethers per hectare. The relationships between the stocking rates are governed by the sizes of plots fenced for 66LG11.

RESULTS 1975

Sheep were only weighed once (30/1/75) after the December body weights shown in the 1974 report. All sheep were losing weight but more rapidly on the volunteer pastures than on the barrel medic. The flock was shorn and not returned to the experiment.

Clean wool yields are not yet available but greasy yields are shown below together with yields from 1973 and 1972.

Mean Wool Yields Per Sheep (kg)

1972 - 1974

Pasture	S.R. sh/ha	Greasy Wool, 1974			Clean Wool	
		Super +	Super -	Mean	1973	1972 *
Cyprus medic	3.7	6.00	5.37	5.69	4.76	-
	5.8	5.57	5.58	5.58	4.53	3.99
	7.4	5.58	5.53	5.56	4.28	4.06
Mean		5.72	5.49	5.61	4.52	4.03
Volunteer	3.7	5.89	5.96	5.93	4.69	-
	5.8	5.92	5.43	5.68	4.30	4.02
	7.4	5.87	5.62	5.75	4.14	3.81
		5.89	5.67	5.78	4.38	3.92

* Stocking rates in 1972 were actually 6.9 and 7.9 sheep/hectare for Cyprus medic and 6.5 and 7.7 sheep/hectare for volunteer pasture.

.../7

It was shown last year that the only significant difference in wool production was between stocking rates, and it is not expected that any of the differences for 1974 will be significant. However it is possible that a gradual response to superphosphate may be developing because 1974 was the first year in which there was any indication of an increased wool yield from this treatment.

Cyprus Medic Seed Yields

Seed yields of woolly clover have not been estimated in this experiment because of the work involved in sampling such small seed with sufficient accuracy. Estimation of medic seed yields was practicable and considered to be more important.

Yields of Cyprus Medic Seed And

Dry Matter (kg/ha) 3/12/74

Super + or -	Stock rate	Dry Matter		Cyprus Seed
		Cyprus	Volunteer	
+	3.7	3777	2380	14.8
	5.8	2427	1542	16.6
	7.4	1898	1243	19.8
		2701	1722	17.1
-	3.7	4228	2010	19.8
	5.8	5583	2765	24.7
	7.4	1430	1988	52.6
		2747	2254	32.4

The most important feature of this table is the relatively low medic seed yields, which give rise to some doubts as to the ability of the cultivar to regenerate sufficiently strongly in 1976. Most probably as a result of strong competition from barley grass, seed yields have dropped from 138 kg/ha in 1972 to about 25 kg/ha in 1974. The difference in seed yields between the Super. and No Super treatments is interesting but difficult to explain satisfactorily without more intensive and detailed measurements.

Wheat

The pasture residues were burnt and the experiment cultivated and sown to Gamenya wheat at about 40 kg/ha in May 1975. No superphosphate was planted with the crop.

Effectiveness of burning varied with the stocking rate giving a very satisfactory burn on low stocking rate plots and a poor burn on most of those stocked at the highest rate. Weeds were well controlled except for patches of smooth mustard (Sisymbrium erysimoides) which appeared to be worst on Cyprus medic plots and at the higher stocking rates.

The crop grew extremely well and was of uniform height and good colour throughout the experiment. In September it was possible to differentiate growth between some plots, but difficult to make a distinction between treatments. Soil moisture at times was marginal but 25 mm. in September and a similar amount in October ensured good grain yields.

Wheat Yields, 1975

Super + or -	Stock rate	Wheat Yields (kg/ha)		
		Medic	Volunteer	Mean
+	3.7	1976	2221	2099
	5.8	2142	2222	2182
	7.4	1951	2204	2078
Mean		2023	2216	2120
-	3.7	1838	2116	1977
	5.8	2093	1906	2000
	7.4	1752	2122	1937
Mean		1894	2048	1971
Means	Medic 1959	Volunteer 2132	Super + 2116	Super - 1971

The wheat yields have not yet been statistically analyzed but it seems that the yields from the volunteer pasture were higher than from barrel medic, as in 1970 (66LG11). The high stocking rate, although increasing the proportion of clover in the pasture, evidently did not increase the wheat yields. The gain of 145 kg/ha of wheat for the addition of superphosphate agrees with the slight response in wool yields, but even if the increases are statistically significant, the increased production would not cover the cost of the 400 kg/ha of super used.

This was a very satisfactory crop and can be considered as a reliable measure of the effect of preceding treatments. Full credit must be given to the able manner in which the Marshall brothers planted the crop and the interest shown and assistance given by the Lake Grace District Office.

.../9

Summary

Briefly:

1. From September 1971 to late August 1974 there was a mean reduction of legume content in the medic pastures from 40 per cent to 22.0 per cent but the reduction at 7.4 sh/ha was to 31 per cent. The drop in woolly clover content on the volunteer pastures was closely similar.

2. In 1972, at 7.4 sheep/ha a difference in body weight of 7-9 kg rapidly developed in favour of sheep grazing barrel medic compared with sheep on volunteer pasture. This difference was maintained consistently throughout the trial. At lower stocking rates the differences were smaller and less consistent.

3. Differences in wool production between pastures and between 'superphosphate' and 'no superphosphate' were small and not significant.

4. In 1975 no advantage in wheat yields was shown from growing the crop after barrel medic compared with volunteer woolly clover and barley grass pasture. Slightly increased production from the use of 100 kg/ha of superphosphate was not profitable.

5. On the results from this experiment no firm recommendation could be made to replace similar volunteer pasture with Cyprus barrel medic. Furthermore at this site it may be several years before the responses from superphosphate justify its use at the same rate and price.

It is hoped to continue this experiment using the same treatments but cropping to wheat in alternate years.

.../10

3.3.0 Comparison of Production from Tornafield Medic, Serradella and Subterranean Clover

3.3.1. Experiment No. 70ME2

Locality: P. Wahlsten, Walgoolan

Soil Type: Wodgil

History: Normal cropping programme had been followed before the experiment was established.

Fertiliser: 673 kg/ha superphosphate and trace elements had been applied up to 1969, & 733 kg/ha from 1970 to 1974.

Treatments:

1970-1972
1. Geraldton subterranean clover.
2. Northam A subterranean clover.
3. Uniserra serradella.

2 stocking rates: 2.5 and 3.8 wethers a hectare.

1973 Sown to Gamenya wheat at 50 kg/ha with 135 kg/ha superphosphate. (Differences in wheat yield were not statistically significant).

1974 Regeneration of pasture treatments from 1972. Stocked at 2 and 3 wethers/ha.

Results 1975

Sheep were removed from this experiment for shearing on October 8, 1974 and were not returned.

Dry Matter and Seed Yields, 11/3/75

	Dry Matter (kg/ha)			Seed (kg/ha)		
Pasture \ Stock Rate	2 sh/ha	3 sh/ha	Mean	2 sh/ha	3 sh/ha	Mean
Geraldton	3717	3750	3734	259	237	248
Northam A	5455	3947	4701	260	160	211
Uniserra	4495	2857	3676	34	95*	65

* One plot only

Total Nitrogen and Carbon Content of Soils 1973, and Wheat Yields 1973 and 1975.

Pasture	Stock rate sh/ha	1973		Wheat Yields	
		Carbon %	Nitrogen %	1973 kg/ha	1975 kg/ha
Northam A	2	.901	.045	1010	1879
	3	.849	.041	908	2042
Mean		.875	.043	959	1961
Geraldton	2	.808	.040	1094	1863
	3	.864	.045	1171	2180
Mean		.836	.043	1133	2022
Uniserra	2	.782	.040	1117	1909
	3	.862	.043	922	1527
Mean		.822	.042	1020	1718
Virgin Soil		.734	.034		

Percentage Legume Content of Pastures 1971 to 1974

Pasture	Stock rate	Legume (%)				Means
		1971*	1972*	1973**	1974	
Geraldton	2	18.2	43.1	43.5	42.5	34.6
	3	23.8	31.3	33.5	49.0	34.7
Mean		20.9	37.2	38.5	45.7	34.7
Northam A	2	18.3	39.6	42.0	36.3	31.4
	3	12.5	31.2	33.5	40.5	28.06
Mean		15.4	35.4	37.8	38.4	29.7
Uniserra	2	8.1	21.8	6.5	15.8	15.2
	3	9.7	20.8	3.0	22.8	17.8
Mean		8.9	21.3	4.8	19.3	16.5

* September

** August. Strips of pasture (2/plot); not cropped, grazed or included in treatment means.

The soils of this experiment were sampled for total carbon and nitrogen by Ian Rowland in late summer 1973. The results show no differences between treatments but an increase on pastured compared with virgin soil. Wheat yields were not significantly different in that year and there were no significant interactions. These results agreed quite well with the legume content of the Geraldton and Northam A pastures but not of the Uniserra pasture.

In 1974 the clovers regenerated and grew well. Uniserra serradella improved but still constituted little bulk in the pasture. The wheat yields for this year showed a marked improvement over the previous crop and, except for stocking rate differences on Uniserra, correlated well with legume growth in 1974. The wheat yield from the high stocking rate serradella was lower ($P < .05$) than that from the low stocking rate and any other treatments. No other differences were significant.

3.3.2 Experiment No. 71WH13

Locality: Paddock 3 West A, Wongan Hills Research Station.

Soil Type: Elphin sand, a yellow loamysand to 30 cm. depth overlying yellow-brown gravelly, sandy clay loam. The site originally grew tamma and low mallee vegetation.

History: Virgin land cropped to barley in 1970.

Fertiliser: 404 kg/hectare superphosphate plus trace elements in 1970. 404 kg plain superphosphate in 1971. 202 kg/ha super. in 1972 and 1973 and 135 kg/ha in 1974.

Treatments:

1. Geraldton subterranean clover.
2. Tornafield medic.
3. Pitman serradella.
4. Uniserra serradella.

Northam A was sown at 22.4 kg/ha into the Pitman serradella plots in May 1973.

Two replications.

Plots sizes - 1.01 and 1.35 hectares.

Stocking Rates: 3.7 and 4.9 dry ewes per hectare.

Results:

1975

Mean Legume Dry Matter and Seed Yields

5/3/75

Pastures	3.7 sh/ha		4.9 sh/ha		Mean	
	D.M. kg/ha	Seed kg/ha	D.M. kg/ha	Seed kg/ha	D.M. kg/ha	Seed kg/ha
Geraldton	7295	653.1	5312	679.8	6304	666.5
Northam A	5798	560.6	5274	540.6	5536	550.6
Uniserra	3527	410.8	2419	479.3	2973	445.1
Tornafield	3617	301.9	4467	204.1	4042	253.0

Grass competition in 1974 was much lower on Geraldton than on the other treatments and was excessive on Tornafield. It is highly probable that most of the Tornafield seed shown in the table was carried over from 1973.

Sheep

Two-tooth ewes were used in this experiment with the purpose of mating them at the end of the grazing period and observing whether there was any obvious difference in fertility between ewes grazed on Geraldton and those grazed on the non-oestrogenic pastures.

The ewes were taken off the experimental pastures and mated on January 3rd, 1975. A teaser ram was with the ewes from then until January 17th when three rams were put with the flock. The lambing results are shown below:-

Lambing Details, 1975

Details	Pastures			
	Uniserra	Tornafield	Geraldton	(Serradella) Northam A
Original ewes	19	18	14	15
Ewes grazed not <1 year	-	1	2	2
Ewes replaced in late 1974	1	-	2	2
No lambing record	-	1	2	1
No. of ewes lambed	12	16	12	12
% " " "	(63.2)	(84.2)	(75.0)	(70.6)
No. of ewes which lost lambs	7	4	6	7
% " " "	(36.8)	(21.1)	(37.5)	(41.2)
Dry ewes	7	3	4	5

There were 20 sheep originally on each treatment and these are accounted for in the top four lines of the table. Percentages were calculated on the sum of the first two items because there is no evidence to link deaths with oestrogenicity of pastures or any other specific factor.

It is fairly obvious that lambing percentages were not related to plant oestrogens. Conception rates were probably lowered by the delayed mating of the ewes and for the same reason the high lamb losses could be accounted for by a high level of mismothering. There were more deaths on subterranean clover than on the other treatments but though ewes on Geraldton were stressed during the winter of 1973, no reason can be given for the poor performance on the serradella - Northam A treatment.

This exercise provides a further illustration of the difficulty of showing the oestrogenicity of pastures under wheatbelt conditions and also indicates the need for more detailed observation of the lambing flock if the results are to be meaningful.

Wheat

The experiment was ploughed on May 1st, 1975, cultivated twice with a combine and in early June sown to Gamenya wheat at 40 kg/ha with 100 kg/ha plain superphosphate.

Inspection of the crop during growth indicated relatively less grass in the Geraldton than in other treatments and plants on this treatment were darker green in colour. This development was expected in view of the greater grass content in the Northam A, Serradella and Tornafield pastures in 1974. The Northam A crop was not eligible, in a strict sense, for comparison with other treatments, having been sown two

.../15

years after Geraldton, following Pitman's serradella in 1971 and an almost pure grass pasture in 1972. Grain yields agreed well with the earlier appraisal of the crop:

Wheat Yields (kg/ha) 1975

Stock Rate / Pastures	3.7 sh/ha	4.9 sh/ha	Mean
Geraldton	3039	3399	3219
Northam A	2592	2856	2724
Uniserra	2416	2358	2387
Tornafield	1970	2073	2022

The above table illustrates the degree towhich a dominantly subterranean clover pasture and superphosphate can improve on initially low-fertility sandy soil. It also shows the effect on wheat yield of dilution of the clover content by grass.

This experiment was cropped most successfully and thanks are extended to the staff of the Wongan Hills Research Station for the efficient way in which they removed internal fences and managed the complete cropping operation.

GENERAL COMMENT

The period from 1971 to 1975 has shown that subterranean clover is the species best adapted to the soil types on which the experiment was sited. However, Geraldton failed completely in the winter of 1973 and it could be argued that a portion of a farm sown to Uniserra could be very useful in such a year. Generally for the stockman, Geraldton gave no advantage at all over the serradella-ryegrass pasture, but for the cereal grower gave a distinct advantage in the cropping year.

Tornafield was not well adapted either to the soil type or to the management. Each year some plants nodulated poorly but were compensated for by plants which grew well. The cultivar was very susceptible to red-legged earthmite attack and to competition from non-legumes in early winter. It appears at present that the extra care required by a Tornafield pasture would not be warranted.

It is hoped that this experiment can be continued into a second phase in 1976.

3.3.3. Experiment No. 69IG24

Locality: T. Griffin, Lake Grace.

Soil Type: Coarse, gravelly yellow sand overlying gravel at a depth of 15 - 30 cm. Wodgil vegetation.

History: Cleared and fallowed, 1965. Cropped, 1966 and 1967. Fallow, 1968.

Fertilisers: 348 kg/ha superphosphate plus copper and zinc up to and including 1968.
1413 kg/ha superphosphate from 1969 to 1974 inclusive.

Treatments:
1. Tornafield medic.
2. Dwalganup subterranean clover.
3. Daliak subterranean clover.

Plot sizes - 1.62 and 2.02 hectares.

Unreplicated.

Stocking Rate: 2.5 wethers per hectare.

Results 1975

On December 2nd, 1974 the estimated mean seed yield on the Daliak plots was 330 kg/ha; on Dwalganup, 193 kg/ha; and on Tornafield 213 kg/ha. Dry matter yields on the Dwalganup and Daliak treatments were similar at about 4,200 kg/ha but that on Tornafield was very much less.

A good burn was managed on the sub. clover plots in March but because of relatively sparse cover the Tornafield plots did not carry a good fire.

The experiment was ploughed in April, worked back in May, and sown on May 27, to Falcon wheat at 43 kg/ha with manganese-superphosphate at 200 kg/ha. On August 12 the crop was sprayed with 2.4-D to control wild turnip and mustard.

When inspected in mid-September the crop generally was a good colour and given continuing rain gave promise of finishing well. Variability in height and growth of the crop within plots was attributed mainly to the varying depth of soil over laterite and its effect on moisture relations and growth of the preceding pasture. Treatments were ranked in the order Dwalganup > Daliak > Tornafield. The crop on the Tornafield plots was lighter in colour, more patchy and much more seriously infested with ryegrass. Poorer burning would have contributed to the ryegrass problem. Wheat yields in kilograms/hectare were:-

Dwalganup 1943; Daliak 1716; Tornafield 1218.

This experiment is now concluded. Sown in 1969, pasture establishment was slow in the dry years to 1972 and Daliak appeared to be the cultivar worst affected by droughty conditions. Continuous grazing with wethers at 2.5/ha started in September 1972 and with years of better rainfall it was possible to graze at this level until the end of 1974. In this time there was little difference in animal production from the pastures but the subterranean clovers improved in comparison with Tornafield medic. Results have generally been biassed in favour of Dwalganup because plot 6 was favoured by topography and depth of soil. At the close of the experiment it can be claimed that Daliak

improved considerably in comparison with Dwalganup and in view of its low oestrogenicity could be recommended with some confidence for the better sections of similar laterite soils. On the more exposed, elevated, shallow soils an early maturing sub. clover of Geraldton maturity would probably be preferable.

3.4.0. Low Oestrogen Legume Species Grazing Trials

Series 2

Experiment No. 68TS12

The intention to terminate this trial early in 1975 was mentioned in the last report. It was later decided to continue the trial through the year and (a) to try and get one more reliable set of lambing records, (b) to follow the effect of the marked grass dominance in 1974.

The first aim was abandoned when a relatively large number of lambs appeared on the experiment about 10 weeks after mating and it was considered that control of the ewe flock was not good enough to give reliable results.

The trend in pasture composition this year was surprising. When visited in early October the experiment had not been grazed since May. In spite of this, all the plots were clover dominant and Seaton Park had recovered from the estimated 3.5% clover content in 1974 to about 70% in 1975. Both the Seaton Park and Daliak pastures were rough but excellent. Dwalganup was not as good, but in view of its less attractive site on top of the stony hill, the pasture was satisfactory.

Seaton Park or Daliak should be safe recommendations for most soils in this area.