



Department of
Agriculture and Food



Research Library

Experimental Summaries - Plant Research

1976

1976 Experimental Summary

D. Gillespie

Follow this and additional works at: <https://researchlibrary.agric.wa.gov.au/rqmsplant>



Part of the [Agronomy and Crop Sciences Commons](#), [Oceanography and Atmospheric Sciences and Meteorology Commons](#), [Soil Science Commons](#), and the [Weed Science Commons](#)

Recommended Citation

Gillespie, D. (1976), *1976 Experimental Summary*. Department of Agriculture and Food, Western Australia, Perth. Report.

This report is brought to you for free and open access by Research Library. It has been accepted for inclusion in Experimental Summaries - Plant Research by an authorized administrator of Research Library. For more information, please contact jennifer.heathcote@agric.wa.gov.au, sandra.papenfus@agric.wa.gov.au.

IMPORTANT DISCLAIMER

This document has been obtained from DAFWA's research library website (researchlibrary.agric.wa.gov.au) which hosts DAFWA's archival research publications. Although reasonable care was taken to make the information in the document accurate at the time it was first published, DAFWA does not make any representations or warranties about its accuracy, reliability, currency, completeness or suitability for any particular purpose. It may be out of date, inaccurate or misleading or conflict with current laws, policies or practices. DAFWA has not reviewed or revised the information before making the document available from its research library website. Before using the information, you should carefully evaluate its accuracy, currency, completeness and relevance for your purposes. We recommend you also search for more recent information on DAFWA's research library website, DAFWA's main website (<https://www.agric.wa.gov.au>) and other appropriate websites and sources.

Information in, or referred to in, documents on DAFWA's research library website is not tailored to the circumstances of individual farms, people or businesses, and does not constitute legal, business, scientific, agricultural or farm management advice. We recommend before making any significant decisions, you obtain advice from appropriate professionals who have taken into account your individual circumstances and objectives.

The Chief Executive Officer of the Department of Agriculture and Food and the State of Western Australia and their employees and agents (collectively and individually referred to below as DAFWA) accept no liability whatsoever, by reason of negligence or otherwise, arising from any use or release of information in, or referred to in, this document, or any error, inaccuracy or omission in the information.

EXPERIMENTAL SUMMARY

D.J. Gillespie

1. Cultivar Evaluation in High Rainfall Areas

a) Midland B/Seaton Park/Yarloop/Larisa (72MT29)

Considerable changes in the clover proportions of some mixtures resulted from cropping during 1975. Generally the proportions measured at germination in 1976 corresponded to the proportions of hard seed present in the soil during the cropping year. The Yarloop/Midland B mixture showed the most marked changes due to cropping with the percentage of Yarloop dropping from 73% (continuous pasture) to 27% (after one crop) at the 1976 germination. See Table 1.

TABLE 1

Effect of cropping on seed reserves, clover proportions and botanical composition

PLOT	Seed Yields 1975		Germination 1976 (%)		Botanical Composition Oct. 1976 (%)		
	Continuous Pasture	Hard Seed under crop	Cont. Pasture	After Crop	Component	Cont. Pasture	After Crop
Seaton Park	926 (46%)	417 (55%)	65	63	Clover	43	73
					Grass	36	19
Midland B	1087 (54%)	341 (45%)	35	37	Weeds	21	8
Yarloop	674 (55%)	86 (29%)	73	27	Clover	18	57
					Grass	30	17
Midland B	560 (45%)	212 (71%)	27	73	Weeds	52	26
Yarloop	397 (35%)	159 (65%)	50	49	Clover	27	70
					Grass	11	14
Larisa	704 (65%)	85 (35%)	50	51	Weeds	62	16
Yarloop	309 (35%)	54 (25%)	50	35	Clover	12	73
					Grass	21	13
Seaton Park	571 (65%)	163 (75%)	50	65	Weeds	67	14

The most striking effect of cropping was the large increase in clover content of the pasture. On average the clover content rose from 25% under continuous pasture to 68% after one crop. This was in spite of considerably lower clover density on the cropped plots early in the season (plant

density on June 22 - cropped plots 950 clover plants/sq. metre; continuous pasture 2 925 plants/sq. metre). This trial will conclude in mid 1977 after obtaining 1976 seed yields and 1977 germination results.

b) Trikkala Evaluation Trial (76MT3)

Various mixtures of Trikkala and Yarloop were sown in April 1976 at Mt. Barker Research Station on new land subject to winter waterlogging. The trial area of approx. 5 hectares is grazed by maiden ewes continuously stocked at 12/ha, and half the treatments are sprayed with benlate to control clover scorch.

In the first year of the trial Yarloop outproduced Trikkala during winter, but Trikkala produced better in the spring. Trikkala started with lower plant numbers than Yarloop (422/sq. metre vs 758/sq. metre), which may partly explain the poorer performance in winter.

Clover scorch had only a small effect on dry matter production in this the first year of the trial.

TABLE 2

Dry Matter Production Trikkala and Yarloop (kg/ha)

PLOT	Germination to Aug. 3 (13 weeks)	Aug. 3 to Sept. 15 (6 weeks)	Sept. 15 to Oct. 27 (6 weeks)	Total Yield to Oct. 27
100% Yarloop	2186	3244	1627	7057
+ 36% Trikkala + 64% Yarloop	1644	3186	2189	7019
100% Trikkala	997	2723	3134	6854

2. Pasture Deterioration - High Rainfall Areas

a) Phytotron experiments

Six trials were carried out during the year in the controlled environment cabinets examining various aspects of the effect of root rot on sub clover germination and survival.

The largest trial involved screening some fifty three clover strains for possible resistance to root rot attack. About twenty crossbred lines bred by Dr Francis and selected as being highly resistant to Kabatiella infection were included,

and many of these exhibited a high degree of resistance to root rot. None were highly susceptible. Control varieties again gave similar results to previous trials with Dinninup and Daliak being fairly resistant, and Yarloop and Mt. Barker being highly susceptible (see Table 3).

TABLE 3

Susceptibility of sub clover varieties to root rot infection after four weeks growth

Variety	*Tap Root Disease Index (%)	
	1975 Results	1976 Results
Daliak	41	49
Dinninup	49	44
Woogenellup	79	-
Yarloop	77	79
Mt. Barker	91	78
Nangeela	48	46
Midland B	73	70
Toodyay C	65	-
Guildford D	51	27
Jarrahdale B	48	41
Trikkala	62	46
Larisa	75	34
Dinn. x (Daliak x Tood. C) (av. of 6 crosses)	-	31
Dinn. x (Mid. B x Nangeela) (av. of 3 crosses)	-	37
Daliak x (Mid. B x Nangeela) (av. of 4 crosses)	-	41

* 100% = All plants dead

0 % = No plant death or staining of the tap root

Other trials were concerned with the effects of inoculation, addition of nutrients, and waterlogging on root rot incidence and plant survival. Inoculation and nutrients appeared to have little effect, but waterlogging greatly increased seedling mortality. Whether this was due to the effects of waterlogging per se, or to increased root disease, could not be determined from these preliminary trials.

b) Field experiments

Two root rot observation trials were sown in autumn 1976 - one at Walpole and one at Manjimup. Both were sown on old deteriorated pastures and six varieties were compared. Preliminary results for 1976 are given below:

TABLE 4

Variety	76MA8	76DE3		
	Establishment Aug. 1976 Plants/sq.m	Establishment July 1976 Plants/sq.m	D.M. Yield (kg/ha-Sept)	
			Clover	Other Species
Dinninup	163.5	136	1021	602
Woogenellup	142.5	75	649	482
Mt. Barker	156.0	81	500	614
39314YB	90.5	20	45	705
Guildford D	118.5	110	850	829
Williams D	63.0	-	-	-
14218A	-	76	469	615

Three cultivation trials were established late in 1975 and were monitored during 1976. The autumn of 1976 was very dry throughout W.A. and resulted in a much lower incidence of root rot along the south coast than has been the case in previous years. This restricted the amount of useful data that could be obtained from field trials. Fortunately most of the above are long term trials.

3. Lucerne Productivity and Persistence

Two trials were sown into established pasture at Esperance Downs Research Station in spring 1974. One trial has been continuously grazed with cattle since April 1975, and the other rotationally grazed with sheep since that time (3 paddocks - 2 weeks/paddock).

A further trial was sown on new land at Green Range (Albany) in late autumn 1975 and has been grazed with cattle since autumn 1976 (not continuously).

The results of these trials, for 1975 and 1976, are summarized in Table 5.

TABLE 5

Lucerne Productivity and Persistence

	TRIAL	DATE	VARIETY							
			Demnat	Aragon	CPI 16601	Siro Peruvian	Paravivo	Cancreep	Hunter River	H.R. + Daliak
PLANT DENSITY (Plants per Square metre)	74E3 Sheep	Oct. 74	24.1	19.7	21.4	24.6	24.1	18.9	15.7	19.2
		May 75	8.8	14.1	19.1	14.1	13.3	5.9	13.9	9.6
		Feb. 76	14.2	12.1	12.8	15.3	16.5	11.6	9.8	12.8
		May 76	10.8	17	9	12	15.8	10.8	13.8	7.3
	74E4 Cattle	Oct. 74	-	-	-	33.1	27.7	20.8	23.9	22.1
		May 75	-	-	-	17.2	17.2	15.8	15.4	14.6
		Feb. 76	-	-	-	25.1	18.1	20.6	21.9	16.9
		May 76	-	-	-	21.5	9.3	12.3	15.5	13.5
DRY MATTER YIELD (kg/ha) 6 weeks growth	74E3 Sheep	Sept 75	186	215	226	306	289	108	151	144
		Jan. 76	693	767	730	1050	836	925	754	850
		Sept 76	403	471	459	566	485	362	342	478
	74E4 Cattle	Sept 75	-	-	-	665	621	572	482	675
		Jan. 76	-	-	-	470	633	813	618	669
		Sept 76	-	-	-	705	902	667	631	766
	75AL30 Cattle	Oct. 76	80	-	-	209	151	286	333	268*
		Nov. 76	88	-	-	195	244	370	460	325*

* No Daliak sown at Green Range

5.

227

4. Effects of Saline Irrigation Water on Pasture Production

A trial was commenced in December 1973 to measure the effects on pasture production of irrigation with water from Wellington Dam (500-600 mg/l of salt) compared to water from Stirling Dam (150 mg/l of salt). The trial was situated at Benger, south of Harvey on an established irrigation pasture.

Preliminary results in 1973/74 showed no observable pasture differences due to irrigation with Wellington Dam water compared to Stirling Dam water. The trial lapsed in 1974/75 because of low salinity levels, but was re-commenced in 1975/76 (Wellington Dam 550 mg/l salt) and is being undertaken again in 1976/77 (approx. 700 mg/l salt).

Results for 1975/76 are shown below :

TABLE 6

Pasture Yield and Clover Chloride Concentration

Date Cut	Treatment	Pasture Yield kg/ha					Clover Chloride (%)
		Clover	Paspalum	Kikuyu	Total	Total Yield kg/ha/day	
29/12/75	Stirling	314	806	109	1229	38.4	4.52
	Wellington	496	682	224	1402	43.8	4.20
30/1/76	Stirling	357	569	560	1486	46.4	3.01
	W'ton	337	786	393	1516	47.4	3.45
4/3/76	Stirling	274	1670	748	2692	79.2	2.90
	W'ton	214	1230	577	2021	59.4	3.34
6/4/76	Stirling	127	776	211	1114	33.8	2.64
	W'ton	121	1025	321	1467	44.5	2.85
Total	Stirling	1072	3821	1628	6521	49.4	3.10
	W'ton	1168	3723	1515	6406	49.3	3.33

Irrigation with either Wellington or Stirling Dam water resulted in no measurable differences in white clover, paspalum or kikuyu dry matter yields, no differences in total pasture daily growth rates, and no significant differences in clover chloride levels during the 1975/76 irrigation season.

This trial is continuing this season. The level of salt in the Wellington Dam is approx. 700 mg/l - considerably above the level that theoretically should effect white clover growth.