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Trial Results 1970 - Yield Data

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TRIAL RESULTS - 1970.

M.L. POOLE, RESEARCH OFFICER, PLANT RESEARCH DIVISION.

(February, 1971.)

This Report Summarizes Yield Data for the following Trials:-

- Trial 1 : Rates of Seeding Arlo and Target Rapeseed - Wongan Hills Research Station.
- Trial 2 : Rates of Seeding Arlo and Target Rapeseed - Mt. Barker Research Station.
- Trial 3 : Rapeseed Variety Trial - Esperance Downs Research Station.
- Trial 4 : Rapeseed Variety Trial - Mt. Barker Research Station.
- Trial 5 : Competition between Wheat, Linseed, Rape and Wimmera Rye Grass - Mt. Barker Research Station.
- Trial 6 : Tolerance of Wheat, Oats, Barley, Linseed and Rape to Waterlogging - Mt. Barker Research Station.
- Trial 7 : Harvesting Trial - Arlo Rape - Mt. Barker Research Station.
- Trial 8 : Harvesting Trial - Target Rape - Mt. Barker Research Station.
- Trial 9 : Miscellaneous Species Trial - Mt. Barker
- Trial 10: Flowering and Maturity of Arlo and Target Rapeseed in different environments.

Note: (1) Yields only given here. Quality yet to be assessed - in terms of oil content, moisture content, purity etc.

(2) Statistical analysis not available for all trials.

TRIAL 1.

70 WH 16/2855EX

Rates of Seeding Arlo and Target Rapeseed.

Locality: Wongan Hills Research Station
Soil Type: Wongan loamy sand.
History: Subclover 1967-69. Old clover land.
Fertiliser: Superphosphate 180 lb/ac. Seed and superphosphate dropped on surface and harrowed in. (Urea topdressed 60 lb/ac. at seedling.) Sprayed for red mite after seeding.

Harvest Yields:

- (1) Arlo hand harvested and machine harvested 11th November, 1970. Machine harvested figures used below because of lower variability. No rutherglen bug.
- (2) Target quadrat harvested 18.12.70. Rutherglen bug thick on crop, particularly round edges.

(3) Replications. Plots 400 X 10.5 lk₂

Sown 10.6.70.

Seeding Rates lbs/ac	Seed Yield lb/ac ARLO	Seed Yield lb/ac TARGET
2	495	196
4	704	267
6	783	303
8	904	326
10	874	301
12	910	357

Results: Arlo: response to 8 lb/ac, Target to 6 lb/ac.

Comments:

- (1) Arlo held in pods until the end of November, and could have been satisfactorily harvested under cool conditions until then.

Target was ready to harvest on 12th December. Little shedding had taken place by the 18th December. Target was severely infested with Rutherglen bugs at harvest and would have been a problem with machine harvesting.
- (11) Very heavily infested with aphid in late July. Sprayed with Metasystox 8 oz/ac. Usefulness as a seeding rate trial somewhat marred by this.
- (111) Higher seeding rates completely shaded out capeweed, which caused some trouble in lower seeding rate treatments.
- (1V) Planting to maturity.

Arlo : 154 days.

Target : 184 days.

TRIAL 2

70 MT 19/2855EX

Rates of Seeding Arlo and Target Rapeseeds

Locality: Mt. Barker Research Station
Soil Type: Gravelly loam
History: Old clover land, clover 1969.
Fertiliser: Superphosphate 180 lb/ac. Urea topdressed
60 lb/ac. Seed and superphosphate dropped
on surface and harrowed in.
Harvest Yields: (1) Arlo machine harvested 25th November -
No problems.
(2) Target machine harvested 15th December -
No problems.
(3) Replications. Plots 400 x 10.5 lk₂

Sown 29-5-70

Seeding Rates lbs/ac.	Seed Yield lb/ac. ARLO	Seed Yield lb/ac. TARGET
2	1704	1161
4	1571	1390
6	1580	1085
8	1390	1190
10	1314	1171
12	1314	1057

Result: Arlo shows negative response to seeding rate,
2 lb/ac. best.
Target no differences.

Comments: (1) No problems of any kind encountered with these
crops. Trial was sprayed with D.D.T. at seed-
ing for R.L.E.M, control and twice during the
season with metasystox for aphid control.
However, these were precautionary measures and
neither insect was troublesome at the time of
spraying. About 30 lbs/ac of each variety was lost
onto the ground, mainly before the crop entered
the machine.

(11) Planting to maturity.

Arlo : 178 days.
Target : 198 days.

TRIAL 3

70 E 25/2855EX

Rapeseed Variety Trial

Locality : Esperance Downs Research Station

History : Old clover land. Clover 1969.

Fertiliser: Superphosphate 170 lb/ac. Seed mixed with superphosphate, dropped on surface and harrowed in. Seeding rate 6 lb/ac. Urea topdressed before seeding at 80 lb/ac.

Harvest Yields:

All plots harvested 11-12-70. The Arlo and Echo plots were ready to harvest 2 - 3 weeks before but machine not available. Slight shattering of these varieties had occurred.

Sown : 30-6-70

3 replications. Plots 200 x 10.5lk²

Variety	Yield lbs/ac.
ARLO	846
ECHO	788
TARGET	1010
POLISH	1051

Comment:

- (1) Yields quite good considering the late seeding date. This trial was sown to preliminary test "Polish" (believed be the variety Masowieki). Its yield is encouraging and indicates further trials necessary.
- (11) Polish matured two weeks later than Arlo and a week before Target.
- (111) Days to maturity (estimates for Arlo, Echo):
 - Arlo, Echo : 146
 - Polish : 157
 - Target : 164

TRIAL 4

70 MT 27/2855EX

Rape Variety Trial

Locality : Mt. Barker Research Station,
Soil Type : Gravelly/sand
History : New Land cleared 1968. No previous crop
Fertiliser: 360 lb/ac. Super Cu Zn Mo No. 1.
150 lb/ac. Urea at seeding (through seed box).
Seed and fertiliser topdressed onto plots with
tubes out of boots, and harrowed in.
Harvested : All varieties on 23-12-70. Arlo, Echo, had
matured about two weeks earlier.

Sown : 26th June

3 replications. Plots 200X10.5
1k²

Variety	Yield lb/ac
Arlo	948
Echo	844
Target	525
Polish (un-named)	990

Comment:

- (1) No difficulties at any stage. Yields good for late planting on new land, although fertiliser input very high.
- (11) Sown to test the "Polish" variety, believed to be Masoweiki. It performed well and further trials are indicated.
- (111) Days to mature:
- Arlo, Echo. - 167
Target - 180
Polish - 175

TRIAL 5

70 MT /2855EX

Competition between Wimmera rye grass and Rape, Linseed & Wheat

Locality : Mt. Barker Research Station.
 Soil : Gravelly sand
 History : New land not used previously for agriculture.
 Fertiliser : 180 lb/ac. No. 1 Mix superphosphate. Plain superphosphate 180 lb/ac. Urea 300 lb/ac.
 Method : No. 1 Mix superphosphate 180 lb/ac. topdressed prior to seeding 300 lb/ac. Urea topdressed prior to seeding. Crop sown drilled with superphosphate. Wimmera rye grass topdressed on at 16 lb/ac. with clean sand ballost.
 Sown 21-5-70. 4 replications. Plots 300 x 10.5 lk²

(1) Establishment Counts - Plants 1 yd²

CROP			
	(a) Pure Crop	(b) Crop +WRG	b/a %
Wheat 40 lb/ac.	97	90	92.8
Linseed 35 lb/ac.	242	212	87.6
Rape 6 lb/ac.	100	85	85.0

WRG density alone and with crops 222 plants/yd².

(11) Dry Matter Cuts lbs/acre.

a) Sampled 11-8-70

CROP - DM.

	(a) Pure Crop	(b) Crop +WRG	b/a %
Wheat	830	358	43.1
Linseed	234	54	23.1
Rape	1670	1312	78.6

WRG - DM

	(a) WRG only	(b) WRG + Crop	b/a %
Wheat	559	418	74.8
Linseed	559	480	85.9
Rape	559	332	59.3

b) Sampled 14-9-70

CROP - DM

	(a) Pure Crop	(b) Crop + WRG	b/a %
Wheat	1932	1002	51.9
Linseed	1143	209	18.3
Rape	4154	3325	80.0

WRG-DM

	(a) WRG Only	(b) WRG+Crop	b/a %
Wheat	2358	1845	78.2
Linseed	2358	2228	94.5
Rape	2358	1178	49.9

TRIAL 5 (cont.)

(111) Grain Yield lbs/ac. (sampled when each mature).

CROP

	(a) Pure Crop	(b) Crop + WRG	b/a %
Wheat	847	204	24.1
Linseed	720	183	25.4
Rape	1529	1000	65.4

(1V) WRG - DM at maturity lbs/ac.

	(a) WRG only	(b) WRG + Crop	b/a %
Wheat	4436	4334	97.7
Linseed	4436	4115	92.7
Rape	4436	2293	51.6

Comment

Comment:

Rape showed clear ability to compete well with this very heavy stand of Wimmera rye grass. The wheat and linseed failed under competition and could not be machine harvested.

The wheat was affected by root rots and normally might compete better than this. The mid season dry matter cuts demonstrate the very poor competitive ability of linseed.

TRIAL 6

70 MT 20/2855EX.

Tolerance of Wheat, Oats, Barley, Rape and Linseed to
Waterlogging at two rates of nitrogen.

Locality : Mt. Barker Research Station.

Soil Type : Graveling sand.

History : New land not used previously for agriculture.

Method : This trial had plots 6 chains long going from a well drained hilltop down into a waterlogged valley. Severe waterlogging lasted for about two months - July and August. However, the water was never more than about 2" deep. For sampling the top two chains of the trial were used for non-waterlogged, and the bottom two selectively used for waterlogging treatments.

Fertiliser : Site topdressed with 180 lb/ac. No:1 mix before seeding Urea rates of 50 lb/ac and 300 lb/ac topdressed before seeding. Crops sown with 180 lb/ac. plain superphosphate wheat, Oats, Barley sown 40 lb/ac. Linseed 35 lb/ac. Rape 6 lb/ac.

Date sown : 21-5-70 Replications : 4 Plots 600 x 10.5 lk²

(1) DRY MATTER CUTS 10-8-70 lbs/ac.

Treatment	Not Waterlogged(a)	Waterlogged(b)	b/ax 100%
Wheat + Urea 50	520	301	57.8
Wheat + Urea 300	1530	514	33.6
Oats + Urea 50	586	387	66.0
Oats + Urea 300	1505	594	39.5
Barley + Urea 50	445	182	40.8
Barley + Urea 300	1224	300	24.5
Linseed + Urea 50	103	63	61.2
Linseed + Urea 300	94	46	48.9
Rape + Urea 50	431	35	8.1
Rape + Urea 300	1103	113	10.2

AOV Replications n.s.

Waterlog vs Not Waterlog(W) ***

Species (S) ***

Nitrogen (N) ***

S X N *

S X W ***

N X N NS

W X S X N NS

(cont.)

TRIAL 6

(11) GRAIN YIELD lbs/ac.

TREATMENT	Not Waterlogged(a)	(b) Waterlogged	b/a x 100%
Wheat + Urea 50	1032	107	10.4
Wheat + Urea 300	1296	323	24.9
Oats + Urea 50	1904	239	12.5
Oats + Urea 300	2092	334	15.9
Barley + Urea 50	1289	208	16.1
Barley + Urea 300	1514	426	28.1
Linseed + Urea 50	288	17	5.9
Linseed + Urea 300	438	10	2.2
Rape + Urea 50	251	0	0
Rape + Urea 300	612	12	1.9

AOV Replications : N.S.
 † Waterlogged VS Not (W) ***
 Species (S) ***
 Nitrogen (N) ***
 S X N N.S.
 S X W ***
 W X N N.S.
 W X S X N N.S.

Comment:

In terms of appearance, growth and yield rape was extremely intolerant of waterlogging. Linseed followed in terms of yield.

Amongst cereals, wheat with high nitrogen appeared most tolerant in terms of growth and barley least tolerant. It is most interesting that in terms of absolute yield and percentage of non waterlogged controls barley was best.

TRIAL 7

70 MT 29/2855EX

Arlo Rape Harvesting Trial

Locality : Mt. Barker Research Station 1970.

Background : A uniform area was chosen in a bulk crop of Arlo rapeseed. The crop was mature on 25th November, however rain intervened before the plots could be harvested. The rest of the bulk crop surrounding the trial was harvested on that date and estimates of shattering, oil content, moisture were done on that trial.

Plots were successively harvested at intervals over the next month, the last harvest being on 5th January. Only harvest yields are available at present. Oil content, moisture content, protein and germination are yet to be measured.

Harvest Yields - Arlo harvesting

Date harvested	Yield lb/ac	* Shatter loss lb/ac	Weather Conditions
25-11-70	n.a.	30	Mild
15-12-70	1214	30	Mild
21-12-70	957	56	Very Hot
29-12-70	1100	45	Cool
5- 1-71	985	70	Mild

* Estimated from 15 x 5" ring counts per plot.

Comment:

(1) If the shattering loss figures are reliable, which they appear to be from the original counts, then the yield differences are largely due to site variation other than treatment differences.

The results suggest that Arlo can be left standing for nearly a month after maturity without severely affecting yields. Shattering losses are lower if harvested under cool conditions.

The effect of delayed harvest on seed quality will be important and these comments may need qualification in the light of the quality determinations.

In practical terms this result means that in the Mt. Barker environment *B. campestris* crops can be harvested quite safely over a two or three week period. A farmer therefore could sow up to a one thousand acres and hopefully not encounter harvesting difficulties.

A more comprehensive trial is obviously needed in 1971.

(11)

The MF 31 open front machine was used here. Few serious problems encountered. Main trouble was green wimmera rye grass stalks and spear grass heads blocking the round hole sieve. Some jamming when the machine dropped very low to pick up lodged areas.

TRIAL 8

70 MT 30/2855EX

Target Rape Harvesting Trial

Locality: Mt. Barker Research Station 1970.

Background: Target rapeseed is traditionally much more prone to shattering than Arlo. In this trial a windrow treatment was included whereby the Target was mown and windrowed and allowed to mature in the windrow. This was compared with direct combining as soon as mature and with direct combining two weeks later. Oil and moisture percentage and germination tests are still to be done. A uniform section of bulk crop was used for this trial.

Date Harvested	Yield lb/ac.	Shatter loss lb/ac.	Weather Conditions
16.12.70(Direct)	885	38	Mild
16.12.70 (Windrow)	462	78	Mild
29.12.70 (Direct)	1020	60	Cool

Comment: Windrowing was unsatisfactory. Research Station staff made the following comments:

"Harvesting rape which had been mown and windrowed proved unsuccessful, primarily because the ground was not clean enough. Also the windrow was very uneven with large amounts of material in lumps which made harvesting difficult. Possibly a mower-windrower which leaves an even windrow would eliminate this problem.

Harvesting plots which had just been mown and left in the swathe was more successful provided it was harvested in the same direction as it was mown.

Here again clean ground is essential if it is to be successful."

From a practical viewpoint these results suggest that in the Mt. Barker environment Target crops can be left for a least two weeks from maturity without severe loss. A farmer could therefore harvest large areas of Target over a period of time without severe loss. These remarks may need qualification when quality measurements are completed.

TRIAL 9

70 MT 22/2855EX

Miscellaneous Species Trial

Locality : Mt. Barker Research Station
Soil Type: Gravelling loam
History : Old clover land. Clover 1969.
Fertiliser: Superphosphate 180 lb/ac. Urea 60 lb/ac.

Sown : 1st time of planting 27-5-70 3 Replications
2nd time of planting 23-6-70 10.5 x 300 links

GRAIN YIELDS lbs/ac. (Machine Harvested)	Harvest date in brackets	
	MAY PLANTING	JUNE PLANTING
Target rape 6 lb/ac.	1625 (15/12)	1372 (23/12)
Arlo rape 6 lb/ac.	1981 (25/11/)	1778 (14/12)
Kamenza linseed 40 lb/ac.	1676 (12/1)	1537 (12/1)
Gibson linseed 40 lb/ac.	1219 (12/1)	1511 (12/1)
Gila Safflower 50 lb/ac.	267 (11/2)	1092 (11/2)
Darkon Wheat 40 lb/ac.	1181 (12/1)	1549 (12/1)
Unwhite lupin 50 lb/ac.	1219 (4/1)	-
Weeks iii lupin 50 " "	571 (4/1)	368 (4/1)
White Brunswick Pea 50 lb/ac.	2514 (4/1)	3111 (4/1)
Dun Pea 50 lb/ac.	2794 (4/1)	2565 (4/1)
Polestar + Peredovich Sunflower	failed	failed

Comment:

May planting weeding, mainly capeweed. June planting clean. Peas gave highest yield.

TRIAL 10.

Flowering and Maturity of Arlo and Target Rapeseed Crops in Different Environments.

Rows of each variety representing *B. Campestris* (Arlo) and *B. Napus*: (Target) were planted in May, June and July at Mt. Barker, Medina, Wongan Hills and Jurien Bay. The Wongan and Jurien plots were destroyed half way through the season and were of little use.

At the other two sites observations were made on stem elongation and flower bud formation, duration of flowering, duration of podding and maturity.

These observations were not exhaustive and some interpolation was necessary. Other nearby trials were used to fill in gaps. The maturity estimate at Medina were complicated by irrigation of the plots.

In spite of these shortcomings I believe that Table 1 gives a fairly reliable guide to the development of these crops. A more exhaustive study will be undertaken - 1971.

Again interpolating from former experience, observation and other trials I have attempted to supply a development chart for the Northern Agricultural areas also.

The table shows development of mid-May sown crops at Medina and Mt. Barker and end of May sown crops for the northern areas.

The Mt. Barker data is applicable to the whole southern region from Bridgetown through to Esperance with minor variations of a few days.

The Medina data can be applied to most of the western and central wheatbelt in regard to maturity, but phasic development is slightly later in these inland areas, presumably due to lower temperatures.

Arlo completed its life cycle much quicker in the north than the south presumably in response to temperature and light.

Target behaved somewhat differently and although it did mature earlier in northern areas it remained in the rosette stage and bud stage longer at Medina than at Mt. Barker suggesting that it has some winter habit. This requires close inspection.

The effect of mid-June and mid-July plantings is shown in Table 2. The main impression is that time to first flowers is about the same for all planting dates, but that phases from then on for later plantings are contracted somewhat. The effect appears to be much more severe with July planting than June planting, and in practical terms July planted crops may yield much less than May or June planted crops. Flowering lasted nearly two months for May planted crops, but only one month for July planted crops.

TABLE 1

DEVELOPMENT OF ARLO AND TARGET RAPE VARIETIES IN DIFFERENT ENVIRONMENTS
WITH MAY PLANTING

DEVELOPMENT PHASE	MT. BARKER		MEDINA		GERALDTON REGION	
	ARLO	TARGET	ARLO	TARGET	ARLO	TARGET
Rosette(vegetation)	May 15th - July 15th	May 15th - July 30th	May 17th - July 6th	May 17th - July 30th	May 30th - July 7th	May 30th - July 30th
Stem elongation & Budding	July 15th - July 23rd	July 30th - Aug. 28th	July 6th - July 14th	July 30th - Sept. 8th	July 7th - July 12th	July 30th - Aug. 16th
Flowering (first to last)	July 23rd - Sept. 17th	Aug. 28th - Oct. 26th	July 14th - Sept. 12th	Sept. 3rd - Oct. 22nd	July 12th - Aug. 1st.	Aug. 16th - Oct. 7th
Pod Devel and maturity	Aug. 8th - Nov. 15th.	Sept. 27th - Dec. 5th	July 26th - Nov. 8th	Sept. 27th - Nov. 8th	July 20th - Oct. 25th	Sept. 5th - Nov. 30th
Date of Maturity	Nov. 15th	Dec. 5th	Nov. 8th	Nov. 28th	Oct. 25th	Nov. 20th
Days : Planting-Maturity	184	204	176	196	147	172

Note: (1) Mid May planting for Mt. Barker and Medina. End of May planting for Geraldton.

TABLE 2.

FLOWERING AND MATURITY OF ARLO AND TARGET RAPESEEDS PLANTED IN MAY, JUNE AND JULY IN DIFFERENT ENVIRONMENTS

DEVELOPMENT PHASE	MT. BARKER						MEDINA					
	MID-MAY PLANTED		MID JUNE PLANTED		MID-JULY PLANTED		MID-MAY PLANTED		MID-JUNE PLANTED		MID-JULY PLANTED	
	Arlo	Target	Arlo	Target	Arlo	Target	Arlo	Target	Arlo	Target	Arlo	Target
Flowering Durations	July 23 to Sept.17	Aug.28 to Oct.26	Aug.29 to Oct.15	Sept.20 to Oct.27th	Sept.30 to Nov.15	Oct.20 to Nov.21	July 14 to Sep.12	Sept.8 to Oct.22	Aug.17 to Oct.10	Oct.2 to Nov.5	Sep.17 to Oct.18	Oct.28 to Nov.22
Flowering Peak	Aug.15th	Sept.15	Sept.20	Oct.10	Oct.22	Nov.5	Aug.7th	Oct.1st	Sep.10	Oct.25	Oct.4	Nov.10
Maturity	Nov.15	Dec. 5	Dec.2	Dec.16	Dec.20	Dec.28	Nov.8	Nov.28	Dec.1st	Dec.17	Dec.15	Dec.30
Days to Maturity	184	204	170	184	157	165	176	196	169	185	152	167