DEPARTMENT OF AGRICULTURE AND FISHERIES, SOUTH AUSTRALIA

Agronomy Branch Report

SEED SECTION

REPORT FOR 1978-79

G.E. Cooper
Seed Production Adviser

REPORT 112

- CONTENTS -

SEED SECTION - REPORT FOR 1978-79

1. THE SEASON

1.1 Weather

In contrast to the previous two seasons, 1978 has been ideal for seed production both dryland and irrigated although some areas in the South-East did not receive heavy rains and recharge of underground aquifers has not been adequate from the irrigation seed growers view point.

1.2 Production of certified seed

Total production to 30th September, 1979 was 3 481 tonnes compared with 1 492 tonnes for 1977-78.

Increased production occurred with Jemalong medic, (record) 835 tonnes, Siletina radish 71 tonnes, Hunter River lucerne 639 tonnes, Mt. Barker sub clover 125 tonnes, Trikkala sub clover 56 tonnes, and Harbinger medic (record 311 tonnes.

Most of the increased production was due to the good seasonal conditions; some however is due to the increased area under irrigation.

Full details are given in Table 8.1

1.3 Yields

Average yields from most crops have been very good. A few exception yields were produced e.g. irrigated sub clovers Woogenellup 1 603 kg/ha, Mt. Barker 1 305 kg/ha, Howard 1 370 kg/ha and Swan and Avon oats yielded over 3 t/ha. The top lucerne yield was 1 063 kg/ha of Paravivo. Top yield of dryland Jemalong medic was 795 kg/ha with 32 growers producing better than 300 kg/ha. Harbinger medic yields were extremely good also, with 15 growers bettering 300 kg/ha. Lucerne yields in the North were poor due to flower drop caused by heat wave conditions.

1.4 Lucerne Aphids

The Spotted Alfalfa aphid and Blue-Green aphids have not been so devastating this year, although large quantities of aphid resistant lucerne seed have been sown in the state as a replacement for Hunter River lucerne.

1.5 Sales

Sales have again been good. although there has been a considerable carry over of Jemalong barrel medic. Almost all the Hunter River lucerne seed was exported. Export sales again accounted for most of the seed sales.

Approximately 2 870 tonnes were exported. The main crops being:-

Lucerne	1 102 tonnes
Annual medics	358 tonnes
Sub clover	400 tonnes
Shaftal clover	87 tonnes
Lupins	815 tonnes
Phalaris	42 tonnes

Countries to which sizeable tonnages were shipped included Holland, Italy, Libya, New Zealand, Portugal, South Africa, Spain, Tunisia, U.K., Uruguay, U.S.A. and West Germany.

2. SEED CERTIFICATION PROGRAMMES

2.1 Crop sown under supervision

There was an increase of 2 741 ha of crops sown under supervision compared to 1977-78. Almost all the increase was aphid resistant lucernes from the United States.

Full details are given in Table 8.2

2.2 Registration of perennial crops in non-harvest years

There was a decrease in the total area inspected of 9 495 ha being almost entirely of Hunter River lucerne. This decrease has occurred because of the lucerne aphids, drought and overstocking.

Full details are given in Table 8.3.

2.3 Certification of new crops

2.3.1 Lucerne. During the season there were nine new lucerne cultivars sown in South Australia. This followed the relaxation of state quarantine laws after Bacterial Wilt was found in the Upper Murray and lower South-East areas of the state.

All these lines with the exception of CUF 101 are proprietory lines and therefore are being grown under contract to local seed firms.

2.3.2 Nungarin sub clover

Nungarin is a new early maturing cultivar from W.A. and was grown for the first time in South Australia using W.A. stock seed.

2.3.3 Illyarrie lupins

A new lupin to replace Unicrop entered the commercial scene during the season.

2.3.4 Aphid resistant medics

Sanza barrel medic, Paraponto and Sapo gama medics, Sair and Sava snail medics entered the certification scheme for the first time for the initial seed build up.

2.4 Plot testing

All annuals were sown during the year for post control testing.

2.4.1 Annual medic species. 271 lines were sown and analysed. All met certification standards except 1 line of Harbinger which was contaminated with 5.6% Jemalong.

2.4.2 Subterranean clover. 142 lines were sown and analysed. 2 lines failed to meet certification requirements.

2.4.3 Wheat. 56 lines were sown and found to be satisfactory.

2.4.4 Barley. 27 lines were sown and were all true to type.

2.4.5 Oats. 29 lines of certified oats were sown. Some "off types" were found in most Avon lines.

2.4.6 Lupins. 22 lines of lupins were sown and were all true to type.

2.4.7 Field Peas. 9 lines were sown and were true to type.

2.4.8 Pre-certification testing of Hunter River lucerne. 11 lines were accepted into the certification scheme during the year and 8 lines were sown for observation during 1980.

2.4.9 Grow on testing of annual medics and sub clovers. 17 lines were grown. 8 were accepted for certification. 3 were rejected. 6 uncertified lines were grown for Seed firms.

2.4.10 Currie cocksfoot Breeder seed. 20 kg of Breeders seed was harvested from the clones maintained by the section at Northfield. 22 kg of seed was despatched to growers in South Australia for the production of Basic seed.

2.5 "Truth in labelling"

The system of using self adhesive labels showing details of the line is working well and is particularly useful with export shipments.

2.6 New tags

New "sew in" tags were introduced during the season. They are preprinted with species and cultivar and do not carry the Registered Area number therefore eliminating wastage of tags as with the old system. The tags are made from a very durable synthetic material and being sewn in the centre of the bag means very few get removed during movement of seed.

2.7 OECD Certification.

There has been a big increase in the use of red OECD tags during the year. A total of 36 lines using both red and blue OECD tags consisting of 127 tonnes of seed were handled.

2.8 Mt. Barker sub clover

Contamination by other sub clover strains are an increasing problem in Mt. Barker seed stands throughout Southern Australia. It was decided to reconstitute the variety. 120 lines were sown at Northfield. These lines included seed from W.A., Vic., N.S.W. as well as South Australian lines. These lines were assessed regularly and the remaining plants were harvested to provide Breeders seed.

3. SEED RESEARCH AND DEVELOPMENT

The research and development involves generation of technical information relating to production, processing, storage and utilization of all types of seeds.

Investigations are in progress on herbage, cereal, grain legume, vegetable, flour and turf seeds.

3.1 Seed Production

Evaluation continued on the seed production potential of foreign and local cultivars of herbage grasses and legumes, turf grasses, flowers and vegetables.

Development continued on the new methods for pre-harvest management of vegetable seed crops which are prone to loss due to seed shattering from the mature head.

Significant increases in seed yield and economic returns were possible by spraying the crop prior to harvest with a quick-drying glue. Development continued on the use of cheaper alternate glues, spraying methods and time of spraying in a number of crops, but particularly in onion and carrot seed crops.

Studies on time of harvest in onion seed crops was initiated and the use of growth retardants continued.

3.2 Seed Quality

Storage studies of a range of herbage grass and legume seed under warehouse conditions is continuing. Seed moisture and germination was assessed monthly. Results after three years of storage indicate that germination of all species at all warehouses is beginning to decline. Moisture content of some lines, particularly grasses in the Lower South-East reached high figures in the late winter - early spring period. Significant fluctuations in moisture content were also recorded in lucerne and medic seed in Northern warehouses.

Studies on seed quality in lupin seed is continuing. The relationships between laboratory germination and plant establishment and individual plant seed yield were assessed.

3.3 Seed Physiology

Experiments are in progress to assess germination response to temperature of a range of annual medic species. Response to range of temperature and diurnal fluctuations was assessed on a two-dimensional thermogradient germination plate. Responses in Paragosa gama medic were forwarded to the Germination Committee of ISTA to help establish Rules for the germination of this species.

Studies were continued on the seedcoat anatomy of seeds of the major annual medic and subterranean clover species using the scanning electron-microscope.

It is apparent that in all species permability of the seedcoat to water is achieved by progressive widening of a field of fissures developed in the seedcoat radiating from the region of the chalza.

3.4 Research Projects

* Time of harvest studies for perennial grass seed crops - K.G. Boyce.
* Evaluation of seed production potential of foreign bred species - K.G. Boyce and C.M.J. Williams.
* Influence of temperature on seed germination - K.G. Boyce.

3.4. Research Projects Cont.

* Seed quality investigations with lupins - K.G. Boyce.
* Harvest studies on vegetable seeds - C.M.J. Williams.
* Storage studies with herbage seeds - K.G. Boyce, E.S. Hogg and G.E. Cooper.
* Long term storage studies with annual legume species - K.G. Boyce, E.J. Crawford.
* Anatomical studies on the seedcoat of annual pasture legumes - K.G. Boyce.

4. EXTENSION PROGRAMMES

4.1 Seed Industry Newsletter

Six issues of the Seed Industry Newsletter were published during the year and continues to be widely read both within the state as well as interstate and overseas. 600 copies are distributed of each issue. The Newsletter is produced in co-operation of Seed Industry Association of Australia (Southern Division) and United Farmers and Graziers (Seed Section).

4.2 Field Days

The Seed Production section was represented with the Seed Industry Association and Seed Section of United Farmers and Graziers at the Agricultural Field Days held at Cleve, August 1978.

4.3 Seed Industry Working Party

The Working Party maintained an active program of liaison between sections of the seed industry and the Department. The main areas of discussion were on development of the lucerne seed industry, build-up and promotion of Departmental medic and lucerne cultivars, formation of a Foundation Seed Program to facilitate basic seed supply and facilitating passage of new seeds legislation.

4.4 Seeds Act 1979

On 15th March, 1979, a new Seeds Act was passed by the S.A. Parliament. Dr. Boyce was the Departmental representative involved in discussions on this matter.

5. SEED TESTING LABORATORY

Last season the Seed Testing Laboratory processed 7 575 seed samples for export, quarantine and domestic purposes. In all, 10 500 individual tests were carried out including routine purity and germination analysises, prohibited and restricted weed seed identification, fluoescence tests for varietal strain, and tetrazolium testing to determine seed viability.

These samples consisted of:

Imported Quarantine	72
Uncertified	1 533
Certified	785
OIC	247
BIC	24
Departmental	4 914

Other projects included the completion of weed seed specimen collections, which were distributed to all S.A. cleaners and relevant Departmental Officers. The updating and revision of the reference seed collection was commenced and it is hoped to fully extend and complete this work next season, with the addition of seed specimens from CSIRO, Canberra, and other States.

Experimental work for ISTA in the form of surveys and the usual referee tests for purity and germination were continued. In addition, Referee tests within Australia, mainly involving the tropical grasses and legumes were carried out.

A South Australian analyst attended the Australian Seed Testing Workshop held at the Queensland Department of Primary Industry in Brisbane, September, 1978. A Queensland analyst earlier in the year attended the ISTA Seed Testing Workshop in Wageningen, Holland, and this was an excellent opportunity to discuss present and new techniques in Seed Testing methods and more important seedling interpretation according to ISTA rules. Uniformity in these two areas is very important as the volume of seed moving in International trade is increasing every year.

Again we hosted visits from International Students from Roseworthy and public school students. Displays and specimens were prepared in conjunction with the Seed Production section and UF&G, for the annual Paskeville field day. Work in preparation for a Seed Cleaners school was commenced and it is hoped to hold this day early next season.

One S.A. Analyst, Mrs. V. Wilks, sat for and gained the Australian Seed Testing Proficiency certificate. South Australia now has 5 qualified Seed Analysts.

6. CONFERENCES ETC.

Seminar on the production of basic seed - Waite Agricultural Research Institute, 21st September, 1978 - K.G. Boyce, G.E. Cooper, C.A. Schubert, I.H. Simons, E.S. Hogg, P.D. Smith, C.M Williams.

Australian Seed Industry Advisory Committee Meeting, Canberra, 18th February 1979 - K.G. Boyce, Australian Seeds Committee Meeting, Canberra, 18th-21st February, 1979 - K.G. Boyce.

Consultation with International Centre for Agricultural Research in the Dry Areas, Aleppo, Syria, on seed production, processing and storage - 21st April to 5th May, 1979 - K.G. Boyce.

Annual Meeting of National Designated Authorities responsible for the OECD schemes for the varietal certification of seed moving in International trade - official Australian delegate, Paris, France, 7th-11th May, 1979 - K.G. Boyce.

Study tour of commercial seed trade, seed research, certification and seed testing in Europe, United Kingdom and United States of America, 14th May to 9th July, 1979 - K.G. Boyce.

7. PUBLICATIONS

K.G. BOYCE (1978) Ed. 'Proceedings of Seminar on the production of basic seed" held at Waite Agricultural Research Institute, Glen Osmond, S.A., on 21st September, 1978.

K.G. BOYCE (1979). "The development of seed related activities in ICARDA". Report to the Director-General of ICARDA, Beirut, Lebanon.

K.G. BOYCE (1979). Report to Standing Committee on Agriculture. Proceedings of the Annual and Advisory Group meetings of representatives of the national designated authorities responsible for the OECD Schemes for the varietal certification of seed moving in international trade. Paris, France, 9th to 11th May, 1979.

8.1 Certified Seed Production - Hectares Accepted and Rejected 1978 - 1979

Crop Variety	Hectares Inspected		Kilograms of seed produced from areas accepted from 1/10/78 to 30/9/79	
	Accepted from 1/10/78 to 30/9/79	Rejected from 1/10/78 to 30/9/79	Released	Rejected
Barrel medic:				
Borung	8	-	3 000	132
Cyprus	141	11	66 359	-
Jemalong	3 547	276	835 096	33 824
Sanza	0.4	-	-	-
Cocksfoot:				
Currie	177	8	47 138	1 578
Disc medic:				
Tornafield	220	16	98 427	-
Saleg	3.6	-	627	-
Fodder radish:				
Siletina	101	-	71 091	415
Gama medic:				
Paragosa	31	-	4 206	2 250
Paraponto	1	-	120	-
Sapo	2.5	-	-	-
Linseed:				
Glenelg	11	-	1 500	4 637
Lucerne:				
CUF 101	120.7	4	38 249	-
Hunter River	3 677	10	612 159	30 885
Luna	185	-	17 970	2 966
Paravivo	245	-	65 132	1 712
WL 318	82	-	4 822	-
Lupins:				
Illyarrie	1.55	-	1 628	-
Marri	235	9	101 050	-
Ultra	15	-	20 900	-
Unicrop	298	-	42 228	-
Uniharvest	8	20	-	11 550
Oats:				
Avon	54	9	105 520	-
Cassia	19.5	-	10 076	8 250
Swan	162	-	178 170	5 220
West	1	-	1 400	-
Onions:				
Creamgold	1	-	320	-
Peas:				
Rovar	3	-	-	-

Certified Seed Production - Hectares Accepted and Rejected 1978 - 1979 (cont'd)

Crop Variety	Hectares Inspected		Kilograms of seed produced from areas accepted from 1/10/78 to 30/9/79	
	Accepted from 1/10/78 to 30/9/79	Rejected from 1/10/78 to 30/9/79	Released	Rejected
Phalaris:				
Australian	10	-	-	-
Seedmaster	283	12	95 993	20 711
Sirocco	32	-	1 630	-
Sirolan	4	-	607	-
Sirosa	17	-	7 395	-
Rape:				
Akela	2	-	488	-
Rose clover:				
Kondinin	49	-	2 470	-
Shaftal clover:				
Lupers	9	-	4 344	-
Snail medic:				
Robinson	5.5	-	5 620	-
Sair	0.8	-	134	-
Sava	0.5	-	209	-
Strand medic:				
Harbinger	2 192	120	311 976	6 778
Strawberry clover:				
O'Connors	44	28	6 671	-
Palestine	75.5	80	3 948	-
Subterranean clover:				
Bacchus Marsh	24	-	-	-
Clare	445	2	206 065	2 613
Daliak	28	-	4 386	-
Dwalagnup	60	-	4 300	-
Esperance	3	-	1 466	-
Geraldton	34	-	9 750	-
Howard	17	-	15 711	-
Mt. Barker	1 648	303	125 318	8 908
Nungarin	16	-	2 650	-
Trikkala	337	-	56 759	4 029
Woogenellup	265	-	81 882	6 850
Yarloop	405	24	16 742	1 089
Tall fescue:				
Demeter	221.5	25	84 406	26 283
Tall wheat grass:				
Largo	72	-	280	2 984
Woolly pod vetch:				
Namoi	0.8	-	589	-
TOTAL	15 354.85	957	3 481 784	180 283

8.2 Crops sown under supervision

Crop Variety	1977 - 78		1978 - 79	
	No. fields	Hectares sown	No. fields	Hectares sown
Barrel medic:				
Cyprus	6	150	5	127
Sanza	1	0.4	-	-
Cocksfoot:				
Currie	3	29	3	46
Disc medic:				
Saleg	2	3.6	-	-
Fodder mustard:				
Giselba	-	-	1	20
Fodder radish:				
Siletina	6	74.5	11	101
Gama medic:				
Paragosa	1	8	2	18
Paraponto	1	1	3	14.5
Sapo	2	2.5	1	1
Kale:				
Green angeliter	1	2.5	-	-
Maris kestrel	1	2	-	-
1000 head	-	-	1	7
Linseed:				
Glenelg	1	11	1	7
Lucerne:				
Amador	-	-	1	20
Cimarron	-	-	1	15
CUF 101	19	158.5	54	744.5
Hunter River	7	273	32	617
Luna	3	175	3	38
Matador	-	-	22	351
Paravivo	12	247	-	-
Pioneer 545	-	-	5	63
Pioneer 581	-	-	7	129.5
Resistador II	-	-	3	27
WL 318	-	-	20	176
WL 451	-	-	1	52
WL 514	-	-	4	91
Lupins:				
Illyarrie	1	1.55	2	24
Marri	19	293	19	244.1
Ultra	3	18	13	126.1
Unicrop	11	244	10	272
Uniharvest	2	48	-	-
Oats:				
Avon	7	63	25	462
Cassia	3	19.5	-	-
Moore	-	-	1	10

Crops sown under supervision (cont'd)

Crop Variety	1977 - 78		1978 - 79	
	No. fields	Hectares sown	No. fields	Hectares sown
Oats: (cont'd)				
Swan	12	223	12	183
West	1	1	3	19.4
Onions:				
Brown	-	-	1	1
Creamgold	2	2	1	0.5
Early creamgold	-	-	1	0.1
Peas:				
Rovar	2	3.15	1	3
Phalaris:				
Seedmaster	4	65	2	7
Sirocco	-	-	-	-
Sirolan	1	4	5	42
Sirosa	1	3	13	208.5
Shaftal clover:				
Lupers	2	8.5	2	37
Snail medic:				
Robinson	2	3.5	-	-
Sair	1	0.8	-	-
Sava	1	0.5	-	-
Strawberry clover:				
O'Connors	4	40	10	142
Palestine	-	-	18	247.5
Subterranean clover:				
Esperance	1	3	-	-
Trikkala	13	163.5	22	453
Tall fescue:				
Demeter	11	90.5	2	28
Manade	-	-	3	42
Tall wheat grass:				
Largo	3	69	1	2.5
White clover:				
Haifa	-	-	1	5
Tamar	2	7.5	1	4
White mustard:				
Albatros	-	-	1	1.5
Woolly pod vetch:				
Namoi	1	0.8	2	24
TOTAL	176	2 513.8	349	5 254.2

8.3 Crops registered for 1977-78 and 1978-79.

Crop Variety	Hectares Accepted	
	1977-78	1978-79
Cocksfoot:		
Currie	53	13.5
Lucerne:		
Du Puits	4	-
Hunter River	10 165.5	1 514.5
Paravivo	211.5	71.5
Phalaris:		
Australian	1 567	1 557
Seedmaster	25	16
Sirocco	48	-
Tunisian	1.5	-
Strawberry clover:		
O'Connors	36	54
Palestine	378	215
Tall fescue:		
Demeter	94.5	14
Tall wheat grass:		
Largo	6	-
TOTAL	12 590	3 455.5