



DEPARTMENT OF AGRICULTURE, SOUTH AUSTRALIA

Agronomy Branch Report

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ANNUAL REPORT

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Report No.

SOUTH AUSTRALIAN DEPARTMENT OF AGRICULTURE

AGRONOMY BRANCH

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AGRONOMY BRANCH ANNUAL REPORT 1969-70

I. SEASON REPORT & PRODUCTION TRENDS:

The first useful rains fell in mid-April and were followed by above average rainfall in the cereal growing areas in May. These rains provided an excellent "opening" to the cereal season. Sufficient rain fell in June to continue the season and at the same time allow seeding to proceed under very good conditions. Above average rain occurred over the whole State during July, including the South East which up until then had experienced four months of below average falls. Useful but below average rains were recorded for August and were followed by average or above rainfall for most of the State in September. October and November were mostly dry but a useful rain at the end of October of $\frac{1}{4}$ to 1 inch over the cereal areas completed a year of slightly above average rainfall in most areas. The notable exception was the South East which was considerably below average.

Production of the State's three major cereals exceeded 100m. bushels. This was second only to the record year of 1968-69 (124.6m. bushels) but exceeded the production of 1960-61, the only other season to reach 100m. bushels.

The wheat crop yielded 62.6m. bushels (19.3 bushels per acre), barley yielded 32.4m. bushels (23.0 bushels per acre) and oats 7.25m. bushels (20.1 bushels per acre). The production of field peas and cereal rye were also above average.

Two threats to the cereal crops of the State were rust in some districts and mice over a wide area. However, they did not develop into serious proportions except in relatively small areas. This was mainly due to the dry conditions of October and November.

Growth from pastures exceeded livestock requirements throughout the season. Self-sown crops and cereals sown for feed provided plenty of autumn and winter feed. Medic, clover and lucerne based pastures produced good growth and provided material of good quality for conservation. Yields averaged $1\frac{1}{2}$ tons per acre and the total quantity conserved exceeded 230,000 tons.

Prospects for the 1970-71 season are not so good. The April-July rainfall varies from slightly above average in parts of Central District to extreme drought conditions in the fringe of the cereal belt.

II. DEVELOPMENTS IN INDUSTRY:

1. Wheat Delivery Quotas

Wheat delivery quotas were introduced during 1969-70. This move was forced on the industry because of the rapid expansion in wheat acreage which had taken place during recent years, and the build-up of surpluses, as a result of the inability of world markets to absorb the greatly increased production.

Delivery quotas for individual wheat producers were determined by the Wheat Delivery Quota Advisory Committee and were based on 90 per cent of the average wheat deliveries during the

five-year period 1964-65 to 1968-69. Some quotas were further adjusted after special consideration for the effects of drought, land development and other factors, during the base five-year period.

The introduction of quotas has had a profound effect on the industry. With a limitation on wheat deliveries, many farmers are faced with a decline in income and a possible increase in their levels of indebtedness. Other economic factors have also contributed in large measure to this situation.

Agronomy Branch advisory programmes have been adjusted to take account of this changed situation throughout the agricultural areas. Emphasis is being given wherever possible to alternative crops. Special attention is being paid to management techniques which increase efficiency without the need for large capital outlay.

2. New Cereal Varieties

Two new cereal varieties have been released in South Australia recently and each will have a big impact on the industry.

The two row malting barley variety Clipper, bred at the Waite Institute, tested, multiplied and released by the Department of Agriculture, is an outstanding malting variety and has been readily accepted by barley growers and users. The area sown to this variety in 1970 is estimated to be nearly a million acres or about half of the barley crop. This is a remarkable rate of acceptance after two years.

The variety continues to be the best yielding malting variety at each experimental site, has superior quality characteristics, and is less prone to wind damage than the varieties it replaces. Grain of the variety is attractive to buyers both on visual examination and on the basis of chemical analysis.

Halberd wheat bred at Roseworthy College has proved itself to be a suitable replacement for Heron. In last year's trials its previous indications of high yielding ability were confirmed when it outyielded Heron at 25 sites by almost 30 per cent.

If it replaces Heron and Insignia it will improve the general quality of wheat in the South Australian f.a.q. class. Early indications are that farmers will quickly accept the new variety. Steps have been taken to encourage farmers to accept Halberd as the sole variety through the large area of the State where wheat grain proteins are commonly 10 - 11 per cent.

3. A New Low-priced Herbicide

The use of herbicides to aid cereal production in South Australia has become an important part of the industry since 2,4-D was introduced in 1948. A new milestone was passed during the 1970 sowing season when methbenzthiazuron was introduced for the first time.

This herbicide (marketed as Tribunil^(R)), controls a wide range of cereal weeds at the early post-emergent stage for approximately 70 cents per acre. This treatment is almost as cheap as the 2,4-D applications which will only control the easy

to kill broad-leaved weeds such as mustard and wild turnip at a stage when the crop has fully stooled. At this stage many weeds have competed with the crop resulting in yield losses at harvest. Previous early post-emergent treatments using linuron or prometryne cost at least \$2.50 per acre.

At a time when farm incomes are dropping seriously this new development is most welcome and may well prove to be the most significant for many years.

III. RESEARCH ACTIVITIES:

1. Wheat Agronomy

As in previous seasons the majority of the wheat agronomy programme was concerned with the evaluation of wheat varieties. A total of 55 varieties and crossbreds were evaluated in a series of 40 trials throughout the wheat belt. The lines included in the trials consisted of standard Australian varieties together with crossbreds from South Australian, interstate and overseas wheat breeders.

Outstanding yields were obtained from the variety Halberd, recently released from Roseworthy College. In a series of 25 trials this variety outyielded the widely grown variety Heron by almost 30 per cent. These results confirmed the previous indications of high yielding ability of this variety and led to the recommendation of Halberd to replace Heron in this State. Present indications are that farmers will very quickly follow this recommendation.

In 18 of the variety trials, one variety (Heron) was sown at three seeding rates, 40, 60 and 80 lbs. per acre. In 10

of these trials there was a significant yield response to one of the higher rates, however, in none of the trials did seeding at the highest rate return a significantly better grain yield than seeding at 60 lbs. per acre. These results are similar to those obtained in 1968 but differ somewhat from results of previous seasons when generally there were no responses beyond the lowest rate.

Trials in the period 1963-65 indicated that the standard durum variety Dural would produce only 70 per cent of the yield of the bread wheat variety Raven in environments limiting yields to approximately 30 bushels per acre. A single trial conducted at Turretfield Research Centre in 1969 indicated that while Raven outyielded Dural by 20 per cent some recently available dwarf durum types could outyield Raven by a further 20 per cent. Average yields in this trial were in excess of 60 bushels per acre. This result indicates that there may now be a chance of economically producing this type of wheat in South Australia.

Recent reports both in Australia and overseas indicate a need to produce and exhaustively test new cereal seed dressing fungicides. Two trials at Northfield in 1969 confirmed previous findings that the systemic materials Vitavax^(R) and Benlate^(R) could give good control of both bunt and loose smut of wheat. At the present time bunt is effectively controlled by fungicides of the Hexcebunt^(R) and Ceresan^(R) types but prior to the advent of the systemics there has been no chemical means of controlling the endogenous smuts. While both the new

chemicals are relatively expensive, further trials will attempt to determine minimum rates necessary for control.

3. Barley Agronomy

The 1969-70 experimental programme was based on testing two-row malting type barley varieties over the range of conditions in the cereal belt. Varieties from West Australia and Victoria were tested as well as those from South Australia. Clipper which was first recommended in 1968 again proved to be the outstanding variety under test. Not only was it one of the best yielding varieties at each site, but it also produced the best quality grain. The acceptance of Clipper by both barley growers and barley users has been very rapid. Many growers have already changed completely to Clipper and most of the others are growing some Clipper to test against Prior. Interstate interest in this variety is also high.

Ketch, an early maturing variety bred in South Australia at the Waite Agricultural Research Institute again performed well in trials in the drier areas. It was released to registered seed growers as the recommended replacement for Noyep in early 1970. Although this variety is more a specialised type without the general usefulness of Clipper, growers are showing much interest in it.

Trials were carried out during the year to investigate the effects of varying the time and rate of seeding with Clipper and Ketch. These trials have indicated that both varieties respond in a similar manner to the varieties that they replace and

that changes in recommendations on time and rate of seeding may not be needed. The response of Clipper to applied nitrogen and phosphorus fertiliser was also investigated during the year. In a trial on fertile soil, added nitrogen fertiliser reduced grain quality with little effect on yield. This pattern is again similar to that shown with Prior.

The introduction of several new malting barley varieties to Australia has created problems in grain handling, since these varieties need to be kept separate for best malt production. A basic key for separating some of the varieties on grain characters has been made and is in use, and investigations were continued on methods to further separate varieties. The chief difficulty lies in finding features which are rapid and simple enough to be of use to receival agents.

The production of barley bred specifically for grain feed for livestock is being investigated by breeders. The Department tested some of the lines in these programmes against malting varieties during the year. Even at this early stage in the breeding programmes these lines are yielding 20-30 per cent more than Clipper grown under the same conditions.

3. Pasture Plant Breeding

The Departmental contribution to plant breeding is currently centred on pasture legumes with the broad objectives of improvements in soil fertility and animal production.

Two breeders are working with Medicago; annuals, especially of the barrel medic group, for the wheatbelt; and lucernes for a range of situations from dry wheatbelt, through high rain-

fall regions to irrigated forage crops.

During the period under review the final stages were undertaken of a four year sowing programme aimed at selection of permanent test sites for annual medics. Plots of a common set of Australian medic cultivars were examined at twelve sites, each representative of an extensive medic growing situation in the State's wheatbelt. Winter herbage production, seed and pod (burr) yields and regeneration data have been obtained. These data, and that of previous years now being analysed, are expected to indicate the degrees of similarity between sites in biological terms and the best types of sward trial design and sampling techniques for evaluating very large numbers of entries of both introductions and breeding progeny. Further refinements took place in the field plot mechanisation programme for handling large numbers of entries.

The glasshouse at Northfield was fully commissioned in August, 1969. Considerable progress has since been made both in artificial cross pollinations, growing of F1 material, seed production of accessions and parents, and raising of seedlings for seed increase in the irrigated nursery.

Use of new pre-emergent herbicides has partially overcome weed control problems in the nursery.

Seed was produced of a number of parents used in the breeding programme and several breeding progeny populations. This has been sown in trials at Northfield and Mindarie in which 64 entries are being compared, most for the first time, in swards

The planning of the lucerne breeding programme has been carefully undertaken during this period, with extensive and intensive literature reviews and investigation of all aspects of lucerne growing in South Australia.

As with the annual medic breeding programme, mechanisation will be the key to handling large numbers of entries for field evaluation and much emphasis has been placed on this in planning the lucerne programme. A rubber belt thresher of outstanding performance has been constructed and tested by the breeder.

Co-operative work is also being undertaken with the lucerne breeder with C.S.I.R.O. Division of Tropical Pastures. This work entails a study of seed production of breeders' clones, to be used later in the production of a synthetic variety for Queensland. Seed production of the synthetic will be done in South Australia as we have the best environments for lucerne seed production.

4. Plant Introduction

In 1969-70, 541 lines of the annual medic collection (representing 12 of the 28 annual species) were grown in the Parafield nursery.

Because of the earlier evidence of variability, even within species, all material is being characterised for both morphological and agronomic details. Special emphasis is being focused on seedling vigour, seasonal winter production, time of flowering and maturity, seed production and permeability as the

major criteria for classifying the potential usefulness of individual lines.

A further 581 lines plus selections are being handled in this manner, again for assessment in 1970-71.

All data gathered are being prepared for computer analysis and should be available for dissemination by 1972.

Evaluation of lucerne selections reached a productive stage. In an experiment established in 1964 and continuously sampled for dry matter production at six weekly intervals, Hunter River, by virtue of its superior persistence, has significantly outyielded all other varieties since the fourth year. At no time did the winter dormant varieties, Nomad, Cancreep and Rhizoma appear worthwhile varieties compared with Hunter River.

In an attempt to improve on the persistence of African, selection work resulted in a line which has been compared with African and Hunter River under similar conditions to the trial above since 1965.

Seedling vigour, winter production and recovery after cutting were proven to be equal to or better than African in the early years of the trial. In the fifth year, the selection has been considerably superior to African in persistence. Similar persistence and production data have been gathered under conditions of rotational grazing.

The evidence suggests that this line be registered and released as a new cultivar.

Some annual medic lines are incorporated in three ex-

periments on sandy red brown earths of the Mid North where surface sealing of the soil has previously restricted establishment or subsequent re-establishment. Some material introduced from Algeria has shown considerable promise, and it appears likely that a suitable cultivar for this soil type in the drier parts of the cereal belt can be found.

5. Pasture Cultivar Testing

Assessment of pasture plants is at several levels, viz. preliminary nursery studies, early field testing, advanced field testing and testing under grazing.

A large number of new accessions of a wide range of herbage plants is made each year as a part of the plant introduction and plant breeding programmes. There is a specific interest in introductions of annual and perennial medicago species both as potential cultivars and for use in breeding programmes for the ultimate production of superior cultivars.

Field testing techniques are being improved by mechanisation to enable an accelerated programme of field testing of both the annual and perennial legumes. Efficiency of sowing and harvesting is being increased by improved equipment developed by officers of the pasture group.

For the first time within the pasture group a serious attempt is being made to determine the value of new herbage plant cultivars by measuring animal production rather than plant production. A trial aimed at comparing pastures based on Medea perennial ryegrass, Siro 1146 hybrid phalaris, Victorian perennial ryegrass and pastures with no sown grass has been

established on Kangaroo Island Research Centre.

6. Seed Production Research

This work has two main objectives, viz. increasing the efficiency of production of seed of herbage plant cultivars and hence reducing the cost of pasture establishment; and ensuring rapid multiplication of new cultivars.

An important contribution to improving weed control in seed crops during the year has been the demonstration of the value of Prometryne applied in the early post-emergence stage of newly sown grass seed crops for the control of Cape weed (Arcotheca calendula (Z) Levyns) and Juncus brifonius.

In established perennial grass seed crops studies are continuing on the questions of the optimum time of cessation of grazing, and the optimum nitrogen fertiliser programme. It appears that considerable grazing can take place providing compensatory nitrogen dressings are applied.

The assessment of optimum harvest time by the correlation of maximum yield with land moisture content has been continued. Results so far have enabled seed growers to be advised to swath crops of Demeter fescue when the seed moisture content is near 45 per cent. It is hoped that the optimum moisture content for a range of grass seed crops can be similarly defined.

A front mounted swather has been shown to be speedy and efficient in crops of Demeter fescue, Currie cocksfoot, Medea perennial ryegrass and Australian phalaris. Laboratory, glass-house and growth cabinet studies have been initiated to provide supporting evidence for field experiments.

7. Entomology Research

a. Plague locust

During November-December, 1969, several migrating swarms of the Australian Plague locust (Chortoicetes terminifera) occurred in the Carrieton to Orroroo districts following exceptional thunderstorm activity in the area during the previous summer.

The optimum time for treatment of locusts is during their "hopper" stages, but no landowners in the outbreak areas reported unusual activity and extensive surveys failed to locate hopper bands.

When flying swarms began to emerge from the area, it was decided to treat them with insecticide in an attempt to break them up and prevent further southerly migration into the lucerne growing areas around Jamestown.

Some 5,000 acres were sprayed, both as flying and as settled swarms by aircraft and ground equipment using ultra low volume techniques with technical maldison.

The swarms were effectively dispersed, the southern most swarm reaching to within 14 miles of Jamestown, and no lucerne was damaged.

b. Pasture cockchafer

A programme was initiated to assess the damage caused to pastures by pasture cockchafer (Aphodius tasmaniae) and to evaluate the economics of treating infestations. Preliminary larval counts were made in naturally infested pastures to determine the distribution of the larvae within an infestation.

When the type of distribution and factors affecting the distribution are known, this information, together with an assessment of the loss of production of pasture caused by pasture cockchafer, will be used to develop a sequential plan. This plan will assist a farmer in deciding whether or not to spray a particular paddock for pasture cockchafer.

c. Barley grub

A detailed taxonomic study made on moths thought to be barley grub adults (Persectania ewingii) showed that the following species were also involved:- P. dyscrita, Pseudaletia separata, and Ps. convecta. The moths were collected in light traps and reared from larvae collected from the field. The larvae of these species can only be distinguished by detailed microscopic examination. Identification could become a practical problem if one or more of the species is not susceptible to an insecticide shown to be effective against P. ewingii, and hence recommended for barley grub control. Some failures with trichlorphon sprays in oats may have been due to the dominance of species other than P. ewingii.

A trial of a range of organophosphorus insecticides and endosulfan on P. ewingii in pasture confirmed that the recommended rate of trichlorphon was suitable and that Optunal^(R), chlorfenvinphos, methidathion and diazinon were most promising. Endosulfan as a wettable powder formulation was not effective. The insecticides showing promise will be further tested at more economic rates.

d. White snails

In recent years the white snail (Theba pisana) has damaged lucerne in the coastal areas of the South East. A survey was conducted to map the distribution of T. pisana in the South East and also a closely related white snail (Helicella virgata), which does not damage growing plants. The results of this survey will be used to evaluate the potential importance of T. pisana as a pest.

H. virgata can be a problem in cereal crops at harvest when they climb the stalks and contaminate grain. Trials using the new molluscide Mesurool^(R), against H. virgata in pastures on Yorke Peninsula resulted in an effective broad acre treatment to control white snails. This material will be tested also against T. pisana.

e. Cereal curculio

Phosalone, endosulfan and Dursban^(R) seed dressings gave effective control of cereal curculio (Desiantha caudata) in cereals in a demonstration trial.

8. Plant Pathology Research

The major research activity has been concerned with the "Hatching and Survival of Eggs of Heterodera avenae Wollenweber, 1924". This is now largely understood, and as a result a thesis has been submitted to the University of Adelaide for the degree of Doctor of Philosophy.

Current research activities include the screening of five hundred barley cultivars for resistance to one population of the

cereal cyst nematode (H. avenae) near Mannum. These studies will be expanded next year. The effect of chemicals on infection and development is being examined in the laboratory and in the field.

Diagnostic service and incidence of disease

One hundred and forty diseased field crop specimens were submitted for diagnosis. In several instances Pythium sp. was associated with root rots of peas and annual legumes.

Bacterial blight (Pseudomonas pisi), an important disease of peas is suspected of being spread mainly by the use of diseased pea seed. To reduce its incidence growers should ensure that they purchase clean seed from crops known to be free from the disease.

There was a widespread epiphytotic outbreak of Clover scorch (Kabatiella caulivora) on subterranean clover in the wetter districts resulting in poor production and poor seed set. Cultivars differ in susceptibility, but better sources of resistance than occur amongst our commercial lines are required for a resistance breeding programme. The disease was also identified on Trifolium purpureum, an intended replacement for Yarloop in certain areas.

Halo-blight of oats caused by the bacterium Pseudomonas coronafaciens was identified for the first time in South Australia by a pathologist at the Waite Agricultural Research Institute.

An efficient means of detecting the presence of nema-

tode galls (Anguina agrostis) in samples of rye grass was devised. This will facilitate defining its distribution as part of studies on the death of stock resulting from grazing infected ryegrass in one limited area in the Lower North region.

9. Weeds Research

The weed control section commenced a cereal weed control research programme 10 years ago. This work has always been orientated towards herbicide screening for South Australian cereal weed problems and since 1966 has been supported by Wheat Industry Trust Funds.

A recently evaluated herbicide, methbenzthiazuron (marketed as Tribunil^(R)), paid dividends this cereal season. At 70 cents per acre this herbicide has been found to control a wide range of hard-to-kill broad-leaved weeds at the early post-emergent crop stage. Herbicides previously available, such as linuron or prometryne, cost at least \$2.50 per acre. The methbenzthiazuron treatment is considered to be the most important discovery for cereal weed control since the introduction of the hormone herbicides in 1948. For almost the same cost weed control can now be achieved for an even wider spectrum of weeds at a time when they are most competitive, rather than having to wait until the crop is fully stooled as is the case with the hormone herbicides.

Grassy weeds are still a serious problem and the search for herbicides to deal with these continues. Isonoruron, diuron and dicuran, show most promise.

Weed control in pastures and certain perennial weeds are receiving particular attention by two research officers appointed in 1968. Besides studying practical control measures for salvation jane (Echium lyeopsis) and woolly salvia (Salvia lanigera), the detailed biology of pheasants eye (Adonis spp.), soursob (Oxalis pes-caprae) and silver leaved nightshade (solanum elaeagnifolium), are being undertaken.

IV. EXTENSION SERVICES:

The extension staff of Agronomy Branch has continued to provide information to primary producers, primary producer organisations, members of the general public, to the Government and Government and Local Government Departments on all aspects of agronomy.

To achieve this the three forms of media were used to the full.

The mass media (press, radio and television) have been used extensively to inform the public in general, producers, and other interested parties of the current situation of agronomic matters of interest and importance.

Group activity, mainly with Agricultural Bureaux, at meetings, conferences, farmers' schools, field days and demonstrations was again of very great importance, particularly to officers stationed in country districts. Their work in this field has been supported by technical specialists when necessary.

The great bulk of the person-to-person work of the extension group was carried out by District Agricultural Advisers

and Field Officers working with them. This involves farm visits, office, postal and telephone enquiries and occupies a considerable amount of district officers' time.

The district placement and officer complement for Agronomy Branch is as follows:-

| <u>District</u> | <u>Officer</u> | <u>Centre</u> |
|----------------------|--|---------------|
| Upper Eyre Peninsula | District Adviser | Minnipa |
| Lower Eyre Peninsula | District Adviser | Pt. Lincoln |
| | Field Officer (Weeds) | |
| Upper North | District Adviser | Jamestown |
| | Field Officer (Weeds) | |
| | Field Officer (Hills Country) | |
| Lower North | District Adviser | Nuriootpa |
| | Field Officer (Hills Country) | |
| Yorke Peninsula | District Adviser | Kadina |
| | Assist. District Adviser | |
| Murray Basin | District Adviser | Murray Bridge |
| Murray Mallee | District Adviser | Loxton |
| | Field Officer (Weeds) (part year) | |
| Upper South East | District Adviser | Keith |
| Lower South East | District Adviser | Mt. Gambier |
| | Field Officer (Pastures) | |
| | Field Officer (Weeds) | Naracoorte |
| Central | Agricultural Adviser (Special Duties) | Adelaide |
| | District Adviser | |
| | Field Officer (Hill Country) | |

Central
(Contd.)

Field Officer (Pastures) Adelaide
Advisory Officer (Weeds)
Adviser (Weeds), Local Government
Liaison Officer
Field Officer (Weeds) (part year)

From the above it will be seen that in seven of the districts the adviser has a field officer working with him. This arrangement has not only assisted the district adviser to give greater service but is providing an excellent training for the younger officers.

Extra-ordinary duties occupy a considerable amount of advisory officers' time. One Agricultural Adviser in Head Office is involved in reports on applicants for finance under the Rural Advances Guarantee Act, 1963. He is also involved in inspections and reports for the South Eastern Drainage Board. During the year the Senior Agricultural Adviser and the District Advisers on Eyre Peninsula reported on potential production of two areas for the Engineering and Water Supply Department.

Training in extension methods and techniques continues to be one of the objectives of the Branch. During the year further groups of officers attended in-service training schools. All district officers have now had some specialised training in extension. One officer attended a short course at Melbourne University and another attended a course at Wageningen, Holland. The others have all had training organised and conducted by Dr. Engel of Extension Branch.

Extension work in weed control: For the sixth year in succession officers in the weed control section have conducted formal weed control training courses both for adult night classes and for correspondence students. Local Government, agricultural chemical companies and other Government departments are now benefiting greatly from this training programme. They can now employ fully trained technologists in this field. More than 180 students have passed the examination.

During the year the first specialised weed school was conducted for a group of Agricultural Bureau members.

Two annual publications, "Weed Control Recommendations 1970" and the "Herbicide Spraying Chart 1970" have again been issued. Both are recognised as useful extension material throughout Australia. During the year more than 300 copies of the herbicide recommendation booklet were sold interstate.

V. SEED CERTIFICATION:

1. Certification

A record number of individual lots of certified seed have been released this season. Details are shown in the following table:-

| | <u>Total Lots Released</u> | <u>Total Lots Rejected</u> |
|---------|----------------------------|----------------------------|
| 1969-70 | 906 | 137 |
| 1968-69 | 802 | 183 |

Both the total and the percentage of seed lots rejected this season has been lower than last year. Release standards have remained unaltered, hence there is no doubt that cleaning

of seed has been more effective this season. This has been aided by better field weed control and better attention to harvest-er operation.

The seed certification scheme has run particularly smoothly, there have been no delays in seed releases at any stage of the season. Prompt release has been made possible by the rapid manner in which the Seed Testing Laboratory has handled the large numbers of samples at peak periods.

Plot work associated with certification has been further expanded. For the first time every individual lot of seed certified is being grown in plots in comparison with authentic stock seed. Annual species will be grown for a complete season and perennials for two seasons. This is being done primarily as a complete check on the overall effectiveness of the certification scheme. It however also enables every individual lot of seed to be examined regarding genetic impurity. The use of a permanent area of $2\frac{1}{2}$ acres at Northfield has been obtained for this work, enabling procedures to be used which meet requirements of the O.E.C.D. herbage certification scheme.

2. Establishment of Crops Certified by Pedigree

Following the record expansion last year, the overall increase in acreages of certified perennial crops this season has slowed somewhat. A total of 304 paddocks were sown under certification supervision for the 1969-70 season, compared with 399 for the previous year. The decrease has largely been confined to the perennial grass crops. Sowings of the various lucerne varieties have continued at last year's level.

3. Cleaning Sheds

Due to unsatisfactory handling of certified seed two cleaning sheds have lost "accredited" status during the season.

Additional seed cleaning sheds have commenced operation this season, one at Georgetown in the north and one at Maltee on Upper Eyre Peninsula. These new cleaners have specialised in processing annual medic seeds.

4. Seasonal Summary

The seed harvest has been large, only marginally smaller than the record one of 1968-69.

Low prices for most annual legume seeds did not encourage reaping of low yielding paddocks. Consequently total production of these crops was not as great as had been anticipated. Lack of adequate spring rains also contributed to lower production from all crops but particularly Mt. Barker subterranean clover. However, despite lack of spring rain, larger quantities of lucerne, cocksfoot, Paragosa gama medic, all lucerne, Palestine strawberry clover, Clare subterranean clover and Demeter fescue have been certified than last season.

5. Developments

(a) Export

Several years ago contract multiplication of various kale seed for European firms was experimentally undertaken. Last year, following correspondence with the overseas firms arranging contracts, and with overseas certification authorities, we undertook certification of several paddocks for one grower.

This season this has expanded and we have now commenced certification for eight growers.

(b) Use of soil active herbicides

The use of soil active herbicides to effectively control weeds and unwanted species in seed crops has now become accepted practice.

The increased yields obtained have converted growers who originally doubted the economics of these practices.

Originally it was thought to be economic only on irrigated areas. Today growers are demonstrating the value of these costly herbicides on dryland areas. On these areas the limiting factor in obtaining high yields is invariably lack of available moisture. In removing unwanted plants, more effective use of rainfall can be made by the seed crop.

VI. REGULATORY WORK IN WEED CONTROL:

During the past year more than 120 man days were involved with field surveys to determine the extent and seriousness of infestations of mesquite, Noogoora burr and various species of prickly pear in pastoral areas. Council weed control programmes were aided by surveys carried out for African daisy in the Adelaide Hills and Californian burr down the Gawler River.

The mesquite survey was probably the most important. This provided information for the effective field control of infestation recently found near Broken Hill. An eradication committee has been formed by the N.S.W. authorities to deal

with this outbreak which threatens South Australia, and an officer from this Department has been appointed to that committee to help in an advisory capacity.

Despite serious infestations of Noogoora burr now well established in other states, South Australia has managed to keep its pastoral areas entirely free during the past 10 years. Stock entering the State from infested areas are regularly inspected and during the year 950,000 sheep and 45,000 cattle were inspected at 72 sales. Co-operation from stock agents and buyers is now excellent and only a few lines were quarantined with light infestations.

Subsidies for noxious weed control annually granted to local government authorities exceeded \$100,000 for the first time during this year. Approximately half of that money was used to aid councils to employ well trained inspectors. During January, local government inspectors submitted detailed reports of their work for the first time for Departmental evaluation. Seventy per cent of the local government authorities who have farmer rate payers responded to this task. The information gained will be used to programme Departmental extension, regulatory and research work and help co-ordinate noxious weed control between various councils.