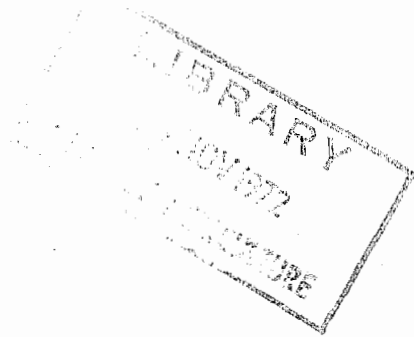


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DEPARTMENT OF AGRICULTURE, SOUTH AUSTRALIA

# Agronomy Branch Report



AGRONOMY BRANCH ANNUAL REPORT,

1971-72

Report No.

SOUTH AUSTRALIAN DEPARTMENT OF AGRICULTURE

AGRONOMY BRANCH ANNUAL REPORT, 1971-72

Report No. 43

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- FOREWORD -

This report is the work of the Agronomy Branch of the South Australian Department of Agriculture for the year ending June 30th, 1972.

The staff gratefully acknowledges the valuable help that the Branch has received during the year from the Executive and other Branches within the Department, The Waite Agricultural Research Institute, the C.S.I.R.O., and the many other government Departments, primary and secondary industries and overseas institutions, which have helped our work in so many ways.

We also wish to thank the many landowners who freely gave of their experience and time to assist our projects.

Chief Agronomist

A.F. Tideman

Principal Officers

E.D. Higgs

J.D. McAuliffe

Senior Officers

G.B. Baldwin

P.R. Birks

A.J. Dubé

T.G. Heard

M.J. Mathison

G.D. Webber

## AGRONOMY BRANCH REPORT - 1971-72

### INTRODUCTION

Operations of the Agronomy Branch have continued to be adapted to face the changing needs of primary industries and landowners in face of the impact of low wool prices and wheat quotas.

The extension staff has had to plan in completely new directions with emphasis on the "problem solving approach" and planned programmes to help farmers with financial management problems and the introduction of alternate crops, such as oil seed rape. Problems associated with the marketing of acceptable products free from contaminants and chemical residues has also been given high priority.

During the year it has also been possible to intensify the extension services provided by the Branch. Two assistant district agricultural advisers were appointed and a new advisory district formed in the Southern Mallee.

Research resources have been re-directed to examine the sitona weevil problem and clover leaf scorch. Attention has also been given to the agronomy of alternate crops. Aspects of the environment in relation to the use of agricultural chemicals now occupies about 20 per cent of the research effort of the Branch and during this year particular attention has been given to seed dressings.

The Branch has imposed upon itself more rigid requirements for recording activities and planning both research and extension work. Improved requirements for research pre-schedules which are now co-ordinated throughout the Department by the Research Liaison Committee should up-grade the standard of the research programme of the Branch. The clear definition of objectives based on the diagnosis of extension problems by our district agricultural advisers are also important steps taken during the year. For the first time such objectives were formally submitted and approved at the beginning of the season.

Never before in the history of the Branch have so many senior staff changes occurred in a twelve months period. Immediately prior to the beginning of this year under review, the Chief Agronomist (Mr. P.M. Barrow), was promoted to Assistant Director of Agriculture (Industry). The year therefore began with Mr. J.B. Doolette acting as Chief Agronomist. However, in August, 1971 after nearly twenty years' service, mainly in agronomy research, Mr. Doolette vacated his position and took up an assignment in Tunisia with Cimmyt.

In March, 1972, Mr. Tideman was appointed Chief Agronomist and Messrs. Higgs and McAuliffe have been acting as Principal Research Officer and Principal Agronomist respectively.

Dr. Banyer who carried out the Branch's plant pathology research resigned in August, 1971 which made the complete reformation of the Plant Pathology Section necessary. The Branch has been fortunate to be able to appoint Dr. Dubé as the new leader of that Section.

Five resignations over a period of eighteen months has now left the Weeds Science Section without any technical officers stationed in the field. This loss of staff has been particularly critical at a time when noxious weed control by local government needs maximum support because of financial difficulties. A vigorous recruiting campaign commenced half way through the 1971-72 period and a new team is now being developed.

The Branch has continued to draw its finances from five different sources, namely, State Treasury, the Wheat Industry Research Committee, the Commonwealth Extension Services Grant, the Wool Research Trust Fund, the S.A. Wheat Industry Research Council and the Meat Research Fund. Finance during the year proved adequate to maintain the activities of the Branch and expand work in some research and extension projects. The much greater use of government vehicles rather than the use of private vehicles on government duty has enabled the Branch to maintain its travelling budget despite increasing costs.

SEASONAL REPORT & PRODUCTION TRENDS

## SEASONAL REPORT & PRODUCTION TRENDS

Favourable conditions in May, 1971 consolidated the excellent start in April to give the State one of the best seasonal openings in recent years. A good growing season followed but prospects for record high yields were adversely affected by below average rainfall for October and a dry mid-winter period in the fringe districts and over wet conditions in the higher rainfall cereal areas.

The production of the main cereals for the 1971-72 season was 52 million bushels of wheat (19.8 bushels/acre), 47 million bushels of barley (24 bushels/acre) and 9.9 million bushels of oats (23 bushels/acre). Barley production was the highest ever for the State.

Other crop yields cannot be as accurately estimated at present. Approximately  $\frac{1}{2}$  million bushels of field peas and  $\frac{1}{4}$  million bushels of rye were harvested. The oil seed rape crop expanded to over 5,000 acres, estimated to yield nearly 2,000 tons. Small areas of safflower and lupins were also harvested.

Certified pasture seed production was less than anticipated. The decrease was mainly due to seasonal conditions. There was increased production of Phalaris, Palestine strawberry clover, Tallarook and Yarloop subterranean clovers and Demeter fescue. Production of all other varieties was slightly less than in 1970-71. The total quantity of uncertified seed handled by seed cleaners throughout the State exceeded the amount certified.

Pasture growth was generally above average. In the higher rainfall districts the spring flush was disappointing because of the wet winter and lack of good rains in October. Clover wilt disease, Kabatiella, also affected spring growth in some areas.

Hay production of 281,000 tons equalled the average for hay production during the past five seasons.

### 2. INDUSTRY DEVELOPMENTS:

The wheat quota for the State for the 1972-73 season is 46 million bushels plus an amount up to 4 million bushels of hard wheat, provided a similar quantity (4 million bushels of hard wheat) is contained in the 46 million bushels.



This is a very substantial improvement on the quotas for previous years; 1969-70, 45 million bushels; 1970-71, 36 million bushels, and 1971-72, 40 million bushels.

The acreage of barley harvested for grain has increased in recent years, 1.4 million acres in 1968-69 to 1.9 million acres in 1971-72. This coupled with the impact of the variety Clipper on yields per acre, was responsible for a record harvest of 47 million bushels in 1971-72.

The acreage sown to peas has exceeded 30,000 acres consistently in recent years.

Growers are moving cautiously into growing oil seed crops as alternatives to the three main cereals. The total area harvested was 5,200 acres in 1971-72

### 3. PROSPECTS FOR 1972-73:

Rainfall for the growing season, i.e. for the months of April, May and most of June, were so far below average that conditions were quite similar to those of the drought year of 1967.

Rainfall for April and May varied between 20 and 40 per cent of normal over most of the agricultural areas with a few more favoured districts up to 55 per cent. Conditions were slightly better in the South East where falls for April and May were up to 60 per cent of normal.

Widespread severe frosts adversely affected what little pasture growth had been taking place in the South East and parts of the Adelaide Hills. Rainfall for June was insignificant in all districts until the last few days of the month when a record late general break to the season occurred.

Prospects for the season therefore depend even more heavily than usual upon favourable spring conditions.

Wheat acreages could be increased by up to 20 per cent because of the increase in delivery quotas. It is also anticipated that the area sown to oil seed rape will be at least three times that of 1971-72.

AGRONOMY ADVISORY SECTION

SECTION LEADER:

Mr. J.D. McAuliffe, R.D.A.

ASSISTANT:

Mr. G.D. Webber, R.D.A., H.D.R.E.

DISTRICT ADVISORY OFFICERS:

Adelaide Office:	Mr. F.C. Gross, R.D.A.
Central District:	Mr. S.G. Williams, R.D.A.
Assistant	Mr. M.A. Schwerdt
Upper North:	Mr. P.J. Mowatt, R.D.A.
Assistant	Mr. D.M. Crawford, R.D.A.T.
Lower Eyre Peninsula:	Mr. K.J. Holden, R.D.A.
Assistant	Mr. P.M.S. Potter, B.Ag.Sc.
Murray Districts:	Mr. K.G. Bicknell, D.D.A.
Lower North	Mr. W.A. Michelmore, R.D.A.
Lower South East	Mr. P.L. Marrett
Eastern Eyre Peninsula:	Mr. R.C. Hagerstrom, R.D.A.
Upper South East:	Mr. P.D. Fairbrother, R.D.A.
Northern Mallee:	Mr. A.E. Hincks, R.D.A.
Yorke Peninsula:	Mr. N.R. Matz, R.D.A.
Upper Eyre Peninsula:	Mr. T.R. Davidson, R.D.A.
Southern Mallee:	Mr. T.J. Dillon, R.D.A.

## AGRONOMY BRANCH SECTION

### 1. SECTION ACTIVITIES:

The extension staff of the Agronomy Branch has provided an extensive agricultural education and information service on all aspects of agronomy to the Government, primary producers, primary producer organisations, industry, to other Government departments, local government authorities and members of the general public. In providing an extension service to producers, increasing use is being made of all available media, that is, person-to-person contact, farmer group meetings and all channels of mass media. The main part of the person-to-person work of the Agronomy Advisory Section was carried out by district agricultural advisers and assistant officers working with them.

This is the front line activity of the extension service and involves farm visits, office calls, telephone and postal enquiries. This extremely important personal service occupies a considerable amount of the district officers' time and attention.

At the farm level district agricultural advisers continue to have a high level of farmer contact, as can be seen from some of the following composite statistics (12 months ended 31st January, 1971), of the extension activities of the field extension officers of the Agronomy Branch.

#### 1.1 Farm Visits

During this period agronomy extension officers made over 2,600 farm visits throughout the State, to assist growers with specific enquiries about all aspects of crop and pasture production, farm management, and often to co-ordinate information into the whole farm operation.

#### 1.2 Technical Enquiries

These are serviced mainly by telephone, office calls, personal contact and postal enquiries. During the 1971-72 year officers serviced 10,000 telephone enquiries and 3,200 office visits. A significant portion of these enquiries continued to be serviced after hours and this makes considerable demands on officers' private time.

More and more emphasis is being placed on the role of group extension by many extension services. In the Agronomy Advisory Section in South Australia, farmer meetings, mainly with Agricultural Bureaux at night meetings, conferences, schools, field days and demonstrations, were again of great importance in the overall extension effort.

The high educational component of the extension service of this Branch is indicated by the fact that district officers provided lectures and/or discussion group leadership at over 300 night meetings and field days throughout South Australia in 1971. District officers attended a further 80 group activities, i.e. conferences, industry meetings and Rural Youth meetings, as speakers or resource personnel.

### 1.3 Mass Media

The mass media (press, radio and television) have been used extensively to inform producers of technical matters and the public of the current situation of agronomic matters of interest and importance. Extensive use is made of both the State and regional press, radio and to some extent, television services.

Each week the Chief Agronomist summarises important crop and pasture developments through the lunch time ABC "Country Hour".

### 1.4 Press

Two hundred and fifty three news items were provided by field extension officers, mainly to regional press outlets. Some officers have contributed to regular district columns. This high level of press service is aimed at keeping a wide range of producers informed on all important agronomic matters.

### 1.5 Radio News & Special Programmes

There were 123 radio items used to bring to producers' attention, important agricultural matters of an urgent nature as well as news of new findings and techniques.

### 1.6 Television

Nine programmes were presented by district agricultural advisers. The regional TV coverage for agricultural programmes is limited, but where possible, officers have contributed to this media.

A number of other activities were carried out by the Section during 1971-72. These activities included:-

- \* Liaison with:-
  - research workers in relation to investigational work in their respective districts
  - industry representatives in trials and demonstrations
  - other Government departments on agricultural matters.
- \* Conducting a large number of agronomic demonstration trials associated with cereals, alternate crops, pasture production, weed and pest control. Demonstrations are seen as an important part of the Agronomy Branch extension work.
- \* Officers provided a monthly report service of agricultural conditions for all districts throughout the year. They prepared special reports on cereal crop estimates and serviced enquiries from the general public, as well as conducting surveys and furnishing reports on such matters as disease infestations and crop damage.
- \* Inspection of approximately 2,000 acres of registered seed crops grown under the South Australian Registered Seed Growers' Scheme. In the 1971-72 season this covered 18 growers of seed wheat and 23 growers of seed barley throughout the State. The provision of quality cereal seed to South Australian farmers is an important factor in maintaining marketable grain.
- \* Judging of competitions, such as bulk wheat competitions for Bureau groups, and assisting with regional Rural Youth competitions in many parts of the State.
- \* Conducting tours for farmers, agricultural students and interstate and overseas visitors.
- \* Service to commerce and industry - the enquiry from and liaison with commerce and industry has continued to increase. Considerable contact was maintained with officers from these fields and officers provided assistance and information to a wide range of commercial organisations, marketing boards, and other research organisations.

Officers within the Section have also carried out special duties associated with Ministerial enquiries and technical reports for other Government departments.

Mr. Gross, specialist adviser in Head Office, prepares reports on applications for finance under the Rural Advances Guarantee Act, 1963 and during the year has continued to give technical assistance to the South East Drainage Board.

The Section Leader, Mr. McAuliffe, has continued to serve on the Primary Producers Assistance Advisory Committee, the Commonwealth Consultation Committee on Drought and the Bushfire Research Committee.

Other officers were involved in lectures to agricultural technology students, assistance with Departmental in-service training schools, and one officer acted as external examiner in practical agriculture at Roseworthy Agricultural College.

## 2. EXTENSION PROGRAMMES:

In order to plan and co-ordinate extension education activities better, a more formal system of extension planning was introduced by the Agronomy Advisory Section in 1971.

Progress in this area of work has been pleasing and by June, 1972 most aspects had been consolidated and these are reported in detail below.

A wide range of planned extension education programmes were conducted at a district level during 1971-72. With changing market outlooks for agricultural products, the Agronomy Branch has developed a policy of increasing production efficiency, promoting product quality and of investigating cultural requirements and the economic feasibility of growing alternate agronomic crops. The main programmes to achieve these ends were as follows:-

### 2.1 Improving Product Quality

#### 2.1.1 Wheat variety recommendations

The changed format for the recommendation of wheat varieties introduced for the 1971 season was seen as a move towards improving the quality and saleability of the South Australian wheat crop. Greater uniformity in both protein content and appearance is likely to be obtained by following the recommendations. The objective of this programme was

to encourage farmers to grow recommended wheat varieties for their region, by informing growers of the market situation and the need to meet industry requirements.

### 2.1.2 Grain insect pest control programme

The objective of this programme was to improve grain insect pest control at the farm level by increasing grower awareness of the problem and informing growers of techniques to control grain insects. The need for this programme arose because of concern about weevil build-up on farms. At least one marketing board has had a publicity campaign running for some years. It has been suggested that a more extensive educational campaign is required to improve the situation and to emphasise to producers that the answer to weevil control must be hygiene with only supplementary help from insecticides.

Copies of technical information bulletins prepared by the Branch and this extension programme were forwarded to grain handling authorities. The marketing boards stated that this programme fell in line with their publicity programmes on grain insect pest control. The Australian Barley Board distributed the programme and the technical information bulletin to all its country officers.

### 2.2 Alternate Crops

Since the introduction of wheat quotas and the onset of low wool prices, growers have shown increased interest in alternate crops. Diversification has been necessary to offset the loss of income because of low wool prices and reduced wheat acreage due to quotas. The aim of the programme was to provide growers with technical, economic and marketing information relating to these crops. Eight district advisers gave this objective high priority and their work plans were successfully carried out during the year.

Observations were made on approximately 120 farmer trial and commercial areas throughout the State.

District officers have maintained contact with farmer committees associated with growing and marketing oil seed crops. In the northern districts, three leaflets were prepared for local growers on technical and economic aspects of oil seed rape production. Press and radio were used extensively to inform growers of all facets of production and harvesting of oil seed crops in all districts.

Information from all agricultural advisers was collated into a special Journal of Agriculture publication, "Oil Seed Rape - A Promising Crop for S.A." Observations on other alternate crops have been made and information extended to growers wherever possible.

### 2.3 Pasture Improvement Programmes

The main areas where these programmes are being carried out are:-

#### 2.3.1 Cereal areas

In the cereal areas, programmes were aimed to:-

- \* Step up the on-going medic programme, emphasising the need for good medic pastures to enable flexibility of production.
- \* Stress the importance of good medic pastures and high soil fertility in relation to cereal root eelworm control.

#### 2.3.2 High rainfall areas

In the higher rainfall areas programmes were associated with encouraging the sowing of perennial pastures in parts of the Lower South East area with a major programme on pasture renovation in the Adelaide Hills. This latter project involved the laying down of a number of demonstrations of the chemical ploughing-sod seeding technique of establishing perennial grasses. A technical report of this work was prepared for the S.A. Journal of Agriculture, May, 1971.

### 2.4 Weed & Pest Control Programmes

The main district programmes in this field were:-

#### 2.4.1 Skeleton weed

Skeleton weed awareness programme - skeleton weed has continued to extend into new localities. New outbreaks in 1971 were recorded on Yorke Peninsula, Eyre Peninsula and in the Lower South East, where these programmes were primarily run. Well timed publicity alerted farmers to watch for possible infestations of the weed and close liaison was kept with district council authorities. Field days were held in the South East and Eyre Peninsula districts on newly located infestations.



Other weed control programmes, such as cape weed control in the South East districts, have been conducted.

#### 2.4.2 Pesticide residues

One of the more important programmes associated with pest control was designed to discourage farmers from using DDT for the control of barley grub in the South Eastern districts. A report from entomology officers that grain received at silos in both the Upper and Lower South East in the 1970-71 harvest was contaminated with DDT, strongly indicated that a programme should be run to discourage its use.

In this programme all types of media were used - T.V., radio and press. Resellers of chemicals were contacted by extension officers advising them of the recommendation. At group meetings and through personal contact, farmers were advised of the recommendations and reasons for them.

### 3. STAFF:

During the year Mr. Dillon took up duties as agricultural adviser in the newly created Southern Mallee district with headquarters at Lameroo.

Two assistant agricultural advisers, Messrs. Crawford and Potter, were appointed to the Jamestown and Lower Eyre Peninsula districts respectively.

One further position has been created to service War Service land settlers on Kangaroo Island but to date no appointment has been made.

The headquarters of the Upper Eyre Peninsula district has been changed from Minnipa to Streaky Bay enabling a more central service to be provided.

These three additional appointments during the year have greatly improved the efficiency of the Section in its efforts to provide detailed agronomic information to farmers throughout the State.

To meet new needs in agricultural extension, providing additional training continues to be an important objective of the Branch. During the year most officers from the Agronomy Advisory Section attended in-service training schools as follows:-

- \* Four officers attended a one week advanced communications school
- \* Three officers attended a teaching processes school
- \* One officer attended a technical induction school
- \* Two officers attended administrative and supervision schools conducted by the State and Commonwealth Public Services
- \* One officer attended the Commonwealth Sheep and Wool Refresher Course held in New South Wales in 1971
- \* Four extension officers undertook an interstate study tour of New South Wales and Victoria to study extension planning, oil seed crop production and cereal agronomy
- \* Three officers attended the South Australian Departmental workshop on programme planning
- \* The Acting Principal Agronomist attended a National Workshop on In-service Training held in Brisbane in 1972
- \* All district officers were given farm management training at regional adviser group meetings during the year. The aspects of training involved were in gross margin analysis, parametric budgeting and cash flow budgeting.

Regional meetings are now playing a more important role in training of officers in all phases of their work, particularly the technical, farm management and extension planning aspects.

#### 4. PUBLICATIONS:

"Oil Seed Rape - A Promising Crop for S.A."  
Department of Agriculture Bulletin 1/72

"Bulk Superphosphate for All Farms"  
Department of Agriculture Bulletin 11/72

"Where is Extension Going?"  
Agronomy Branch Report No. 25

"Agronomy Branch Extension Report"  
Agronomy Branch Report No. 40

"A Summary of Agronomy Extension Objectives for 1972-73"  
Special Agronomy Branch Report

Fifteen papers covering a wide range of technical and extension matters were printed for the 1972 Agronomy Branch Conference. Other papers were prepared for the South Australian Workshop on Programme Planning.

BUSHFIRE PROTECTION SECTION

SECTION LEADER:

Mr. B.J.T. Graham, R.D.A.

EXTENSION OFFICERS:

Mr. B.J. Francis

Mr. R.H.T. Freak

Mr. B.A. Green

SECRETARY, BUSHFIRE RESEARCH COMMITTEE:

Mr. L.D. Murray

BUSHFIRE PROTECTION SECTION

1. SECTION ACTIVITIES:

During the past year, the Bushfire Section has continued to provide a bushfire protection advisory service to rural landholders, householders living in fire prone areas and local and Government departments.

However, the demand from the rural landholder for this advice has fallen in most districts with the possible exception of Eyre Peninsula. This fall in demand has been brought about by a number of factors, but more importantly by the effects of the "rural crisis" and to some degree by the lower incidence of disastrous agricultural fires over the last few years. The steady demand from Eyre Peninsula could be attributed to an increase in the number of large district fires and the fact that Bushfire Adviser, Mr. R.H.T. Freak, is now stationed at Pt. Lincoln.

The Section has become heavily involved in environmental protection issues, both from the ecological damage caused by high intensity fires on the one hand, and the use of fire as a hazard reduction measure on the other hand. Public awareness of environmental issues has highlighted the need for additional research effort into ecologically sound hazard reduction measures.

Mr. B.J.T. Graham, Bushfire Protection Adviser, is a member of the Roadside Vegetation Sub-committee and National Park - Bushfire Research Liaison Committee. Twenty-eight inspections of various national parks were jointly carried out with officers of the National Park Commission.

2. APPLIED RESEARCH PROJECTS:

Work is continuing on a number of existing projects and four new projects have been introduced during the year. Many of these projects are being conducted in co-operation with other organisations.

2.1 Existing Projects

2.1.1 Fire tolerance of fence posts - B.J.T. Graham & B.A. Green

Trials have been conducted to determine the relative fire tolerance of a wide range of fence posts in common use in South Australia. In 1973, it is planned to

conduct a further series of trials using a range of fire intensities on a variety of fence post types. It is specifically planned to assess the fire tolerance of a new C.S.I.R.O. formulation for the preservative treatment of posts. The 1973 project will be a co-operative project with Woods and Forests Department.

2.1.2 Minimum safety requirements for incinerators - B.J. Francis

Following a request from local government, fire safety requirements have been established for the design of domestic incinerators. Currently four manufacturers are constructing incinerators to those standards which have been adopted by many councils.

The future programme will include the assessment of further models coming on the market and quality control inspections of existing approved models. Also an official approval system will have to be developed.

2.1.3 Herbicidal control of unwanted vegetation - B.A. Green & R.H.T. Freak

This project which is being carried out in conjunction with the Weeds Section has concentrated on two specific fields of investigation:-

- \* The use of herbicides to control grass growth on roadsides.

Following research results, large scale result demonstrations were laid down on roadsides in ten district council areas of the State.

- \* The effects of long term use of herbicides sprayed under native vegetation.

Following concern expressed about the deleterious effects on native trees from the continuous use of ground applications of herbicides, trials have been established at two sites in the Naracoorte district. After two years' spraying, no deleterious effects are showing up.

2.1.4 Spark arrester design - L.D. Murray & B.J.T. Graham

Research work sponsored by the Bushfire Research Committee is being conducted by the Mechanical Engineering Department of Adelaide University.

Basically the aim of this work is to establish a standard of spark arrester design which could become the legal minimum requirement for spark arresters fitted to internal combustion engines operating near flammable vegetation.

Work is now concentrating on the development of spark arresters for large diesel engines in the 300-400 horse power range.

2.1.5 Windbreak behaviour study -- B.J.T. Graham  
& B.A. Green

This project is being conducted in co-operation with the Bureau of Meteorology and the Woods and Forests Department. The aim is to test the effectiveness of windbreaks to reduce wind velocities and so qualify as an aid to fire protection.

The work has now reached the stage when all field testing has been completed and a comprehensive work report is being prepared. The publication of the project has been entrusted to the Woods and Forests Department and an extension bulletin of the findings is planned by the Department of Agriculture.

2.1.6 A practical system for measuring grass fuel quantities - B.A. Green & R.H.T. Freak

At present there is no simple reliable method to determine grass fuel quantities - one of the important indices in the McArthur Fire Danger Rating Index which is used to impose fire bans in this State.

Work has commenced to develop a simple method to improve the accuracy of the existing fuel reporting system.

2.1.7 Time of curing of annual vegetation --  
B.J. Francis

This project has similar aims to the fuel quantity studies. Both projects are being conducted in consultation with the Bureau of Meteorology which is the authorised organisation to impose fire bans in this State.

2.1.8 Computerised fire report form -  
B.J.T. Graham

Agreement has been reached by the bushfire organisations to develop a fire report form suitable for computer analysis.

A proto-type form has been developed and was tested during the 1971-72 fire season. Some revision will be required and subject to agreement, further testing of the revised form is planned. The Emergency Fire Service and Woods and Forests Department are co-operators in this project.

2.1.9 Prescription burning in National Parks -  
B.J.T. Graham

The National Park Service has sought assistance in developing techniques for the prescription burning of selected areas of the Cleland National Park. The area has been surveyed, fuel quantities and slopes assessed and a prescription burning plan is being formulated.

3. EXTENSION:

As previously mentioned, the demand for the farm advisory service has fallen, however, approximately 120 properties have been visited and appropriate advice given.

Thirty-four Rural Youth Clubs entered the 1971-72 Bush-fire Community Aid Project which has proved a highly successful means of involving Rural Youth in helping elderly people to reduce fire hazards from their homes.

The rapid expansion of areas dedicated for National Parks and recreation reserves has increased the demand for fire protection advice for these areas. This demand is expected to increase in future years.

The production of general press releases, Fire Prevention Week Kits, and press hand-outs is co-ordinated by a Publicity Sub-committee in consultation with a private firm of public relation consultants.

Supporting this general programme, bushfire advisers assist in the preparation of special fire prevention supplements for country newspapers and special fire prevention articles.

Regular monthly talks are given over 5CK Pt. Pirie and four radio talks were prepared for the Country Hour. Radio talk-back programmes on 5DN and 5AD have also been held. Sixty-three group extension meetings were addressed on a wide range of subjects illustrated with the aid of colour slides and films.

Five fire protection field days were attended.



The Section has also assisted in the production of a series of five 30 second television films in co-operation with the Woods and Forests Department. These films were distributed nationally.

The successful Smokey Birthday Party was again held at the Adelaide Zoo.

4. ACCESS TRACK PROGRAMME:

Inspections and recommendations for the construction of seven separate fire access tracks totalling 28 miles were carried out during the year.

These tracks were constructed in six district council areas at a cost of \$3,597.

The maintenance of all tracks constructed under this programme is the responsibility of the local district council and inspections have shown that the tracks have been adequately maintained.

5. MINISTERIAL ENQUIRIES:

Recommendations have been made in answer to requests from the Minister of Agriculture in regard to:-

- \* New meteorological-fire ban district boundaries
- \* The problem of apiarists under Section 64 of the Bushfires Act
- \* The burning of ships' dunnage on fire ban days
- \* Submissions to the Country Fire Service Working Party
- \* Fire protection problems in the Flinders Range tourist area
- \* Fire Protection Report for Mt. Bonython area
- \* Publicity measures to meet the 1971-72 fire risk.

6. CONFERENCES:

Officers from the Section attended the following conferences during the year:-

- \* Eyre Peninsula Local Government Association Conference
- \* Eyre Peninsula Highways Department - Right of Way School

- \* Regional Agricultural Bureau Conferences
- \* Emergency Fire Service Regional Officer Conference
- \* Fire Fighting Association Conference
- \* Special Fire Mapping Conference
- \* Bushfires and the Environment Seminar
- \* Rural Youth International Training Tour.

## 7. PUBLICATIONS:

Francis, B.J. - "Fires and Farm Machinery". Journal of Department of Agriculture, November, 1971.

Graham, B.J.T. & Simons, J.D. (Highways Department) - "Guide Lines for the Removal of Roadside Vegetation". Highways - Right of Way Manual.

### 7.1 Special Reports

Special reports have been prepared on a range of subjects including:-

- \* The Effects of Windbreaks on Rural Production - B.A. Green - prepared for Bushfire Research Committee
- \* Minimum Fire Safety Standards for Domestic Incinerators - B.J. Francis - prepared for Bushfire Research Committee
- \* Fires in the Open Air and the Bushfires Act - B.J. Francis - prepared for Bushfire Research Committee
- \* Grass Fuel Measurements - B.A. Green - prepared for the Bushfire Research Committee
- \* Factors Affecting Desirable Meteorological District Boundaries in Relation to Fire Ban Districts - B.J. Francis - prepared for ad hoc Committee of Bushfire Research Committee
- \* Fire Protection Factors Affecting Town Planning - B.J.T. Graham - prepared for State Planning Authority
- \* Fire Safety Guides and Their Application in South Australia - B.J.T. Graham - prepared for the Bushfire Research Committee.

CROP AGRONOMY SECTION

SECTION LEADER:

Mr. T.G. Heard, B.Ag.Sc.

RESEARCH OFFICER:

Mr. B.J. Marshall, B.Ag.Sc.

ASSISTANTS:

Mr. N.M. Brooks, R.D.A.

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CROP AGRONOMY SECTION

1. SECTION ACTIVITIES:

Cereal research in the Agronomy Branch is divided into two clear cut programmes, evaluation of the performance of varieties and hybrids in South Australia and developing improved cultural practices.

Staff and equipment are headquartered at the Northfield Research Laboratories. As required they move out to experimental sites scattered throughout the farming areas of South Australia. The majority of sites are on farmers' properties although all appropriate research centres are used.

The wheat performance programme is dominated by trials aimed at measuring the yield and quality of bread wheats. In addition a less comprehensive series of trials examining the performance of durum varieties and varieties with prospects of producing an acceptable flour for biscuit manufacture are conducted.

The barley performance programme follows similar lines to that of the wheat. A major effort is involved in evaluation of yield and quality of malting barley. However, feed type barleys derived from the Waite Institute breeding programme are also being examined.

Oats, although widely grown commercially, are not currently being widely evaluated as insufficient funds have been made available for this work.

Oil seed rape variety trials were conducted at one site, this crop has as yet been grown to a very minor extent in South Australia.

The cultural practice most vigorously investigated during the year under review was the use of seed dressings for bunt control in wheat and covered smut control in barley. Alternatives to the organic mercury and chlorinated hydrocarbons are being sought.

A limited amount of investigation of the effect of time and rate of seeding on yield and quality of wheat and barley was undertaken.

## 2. RESEARCH:

### 2.1 Wheat Variety Trials

#### 2.1.1 Bread types - T.G. Heard

A total of 78 named varieties and hybrid lines were included in a total of 37 trials in the 1971 programme. Trials were sited throughout the State in all major cereal growing areas.

A common set of eight varieties were sown at most sites. Other entries in the trials consisted of newer registered varieties and unnamed crossbred lines from breeding organisations both in South Australia and interstate. Plot size was generally 1.6 metres x 40 metres. The varieties and crossbred lines included in these trials are those which fit into either the "Hard" or the "F.A.Q." class of the present South Australian segregation scheme.

Quality testing of these lines to indicate suitability for bread making or other possible end uses is carried out by the South Australian Department of Chemistry.

Of the named varieties widely tested during the 1971 season Halberd again returned the most outstanding yield with an advantage of almost 10% over the next highest yielding varieties. Glaive was the highest yielding of the hard varieties.

#### 2.1.2 Biscuit types - T.G. Heard

Although wheat varieties may often be designated as either bread or biscuit types, they belong to the same species and differ only in their grain quality.

In 1971 four trials were initiated on different soil types in the Bordertown area to determine the suitability of a number of recently released varieties and crossbred lines for the production of biscuit quality flour. The Bordertown area has been a source of wheat for biscuit flour manufacture in recent years and is the coolest ripening major wheat growing area in South Australia. A number of the entries returned yields in excess of that obtained from the standard variety Pinnacle with one line from the Waite Institute outyielding Pinnacle by almost 30%.

### 2.1.3 Durum types - T.G. Heard

The production of pasta has increased considerably in Australia in recent years with consequent increased demand for Durum wheat. Some Durum wheat is grown commercially in New South Wales and a breeding programme has been established in that State.

Trials were carried out at five sites in South Australia during 1971 with a number of lines from the New South Wales programme. Trials were sited in areas which have in the past produced high protein wheat. The best line under test outyielded the highest yielding commercial Durum variety by 10%, but this yield was itself 10% lower than that obtained from Halberd in the same trials.

## 2.2 Barley Variety Trials

### 2.2.1 Malting barley trials - B.J. Marshall

Barley variety trials during the 1971-72 season were conducted at a total of 21 sites spread throughout the barley growing areas of South Australia. In the main trials nine malting varieties from South Australia and interstate were tested. The recommended variety, Clipper, continued to perform well at most sites and gave good yield and quality results.

An examination of yield data gathered over recent years has indicated that while Clipper generally outyields Prior (the former dominant variety in South Australia) by a substantial amount (20%), in several distinct areas the superiority of Clipper is very slight or non-existent. These sites occur on southern Eyre Peninsula and in the southern Mallee where the soils are sands over clay with a strong probability of available nitrogen being leached by winter rainfall. The response of Clipper and Prior to additions of nitrogen will be examined at several such sites in 1972.

A junior variety trial with entries of 11 new malting varieties from both local and interstate breeding programmes was conducted in the 1971-72 season.

### 2.2.2 Feed barley trials - B.J. Marshall

Feed type varieties from the Waite Institute breeding programme were again tested on a wide scale. This series produced from crosses Bonus or Proctor X C.I. 3576 have normal to late maturity and would be suited to better

areas where high soil fertility or quick finishes to the season prevent the growing of malting quality grain. Of the nine lines tested, two W.I. 2228 and W.I. 2231, outyielded Clipper by 10 and 15% respectively. W.I. 2231 is the line which appears to be resistant to cereal cyst nematode (Heterodera avenae). The lack of a grain feature to distinguish it from Clipper prevents the release of W.I. 2231 at present.

Following good yield and quality results in one trial at Turretfield in the 1970-71 season, a series of six early maturing feed grain lines was tested extensively for the first time during the 1971-72 season. These varieties are intended for the Ketch and Noyep growing areas where due to a short growing season, malting quality is not often obtained. Although designated as early feed grain types in the trial, some of these varieties have good malting quality as well as good yields.

### 2.3 Oat Variety Trials - T.G. Heard

During 1971 oat variety trials were conducted at 7 sites in South Australia in an effort to obtain information on the relative yielding ability of the varieties currently available. In addition to standard varieties, crossbred lines from the Roseworthy College and Western Australian Department of Agriculture breeding programmes were tested. At present in South Australia the dominant varieties in commercial use are the Western Australian varieties Avon, Kent, Swan and Irwin. Results obtained in 1971 indicated that one of the new lines from Western Australia produced yields in excess of those obtained with the current varieties.

### 2.4 Oil Seed Rape Variety Trials - T.G. Heard

Two oil seed rape variety trials were carried out at the Turretfield Research Centre during 1971. The same varieties were included in each trial. The two commercially used varieties, Arlo and Target, were included together with five commercial Canadian varieties. One trial was sown on 18th June but due to the setting of the soil following heavy rain a repeat sowing was made on the 20th July. No consistent picture of relative yielding ability of the varieties emerged from the two trials, although it was obvious that payable returns of approximately 1800 kg/ha. could be obtained from this area with favourable seasonal conditions.

## 2.5 Seed Dressing Trials

### 2.5.1 Fungicides for control of bunt (*Tilletia caries* & *Tilletia foetida*) - T.G. Heard, A.J. Dubé

There is evidence indicating that wheat treated with chlorinated hydrocarbons and organo mercurials has been fed to stock leading to unacceptable levels of residues of these chemicals being found in meat and other animal products. The need to find alternatives with no such hazard has led to the examination of a wide range of fungicides of potential value for controlling bunt.

The major findings from the 1971-72 trials were:-

- \* Maneb and Mancozeb provided good control of bunt at rates as low as 1 gram per kilogram (1 oz./bushel)
- \* These fungicides were not phytotoxic to the seed or young seedlings
- \* A number of other compounds gave indications of ability to control bunt and further testing of these materials appears warranted

### 2.5.2 Fungicides for control of covered smut (*Ustilago hordei*) - B.J. Marshall, A.J. Dubé

Two trials were conducted during 1971-72 to examine a range of potential fungicides to replace organic materials currently used for treatment of covered smut. A large number of possible chemicals were screened in one trial with a standard rate of spore load while in the other trial some of the more promising chemicals were examined over a range of spore loads. No recommendations will be made until further test programmes have been completed during the 1972-73 season.

## 2.6 Investigations into Seeding Rates of Cereals

### 2.6.1 Wheat - T.G. Heard

Wheat seeding rates employed in South Australia range from 40 kilograms per hectare to 100 kilograms per hectare. Trials were conducted during 1971 at Turretfield and Wanbi Research Centres representative of the really good cereal growing country and the very marginal cereal growing country.



At Wanbi there was no response in terms of yield to rate of seeding ranging from 11 kilograms per hectare to 134 kilograms per hectare.

At Turretfield grain yield and rate of seeding were significantly correlated. Regression analysis indicated that over 90% of the variation in yield obtained could be attributed to variation in seeding rate. Grain yield increased with seeding rate throughout the range, this latter is at variance with the results obtained in previous seasons when rates of 55 to 75 kilograms per hectare have generally resulted in maximum yield.

#### 2.6.2 Barley - B.J. Marshall

Following extensive rate of seeding trials in recent years only a relatively small trial was sown in 1971. This consisted of two varieties, Clipper and Ketch, each sown at three rates. The yield and quality results varied only slightly from those obtained in the previous year, the recommended seeding rate remains at about 40 kilograms per hectare.

### 3. STAFF:

Early in 1972 Mr. P.L. Burdon resigned from his position as barley agronomist and that vacancy was filled by Mr. B.J. Marshall.

Mr. T.G. Heard visited the Victorian Wheat Research Institute at Horsham for discussions on the experimental programme aimed at controlling cereal smuts.

### 4. PUBLICATIONS:

Heard, T.G. & Burdon, P.L. - "Cereal Recommendations for 1972". Department of Agriculture, South Australia, Extension Bulletin 28/71.

Burdon, P.L. & Brooks, N.M. - "Windrowing and Rolling Barley Crops". Department of Agriculture, South Australia, Extension Bulletin 24/71.

#### 4.1 Publications for Limited Distribution

Burdon, P.L. - "Barley Varieties in South Australia".

Burdon, P.L. - "Barley Varietal Identification".

Heard, T.G. - "Marketing of Wheat - Lower North Agricultural Bureau Conference".

5. SPECIAL CONFERENCES & COURSES:

Mr. Heard attended the Commonwealth Conference on Oil Seeds, Canberra, August, 1971.

Mr. Heard attended a special training course, "The Wheat Plant - Development, Structure and Function", in Melbourne, January, 1972.

ENTOMOLOGY SECTION

SECTION LEADER:

Mr. P.R. Birks, M.Ag.Sc.

RESEARCH OFFICERS:

Mr. P.G. Allen, B.Ag.Sc.

Mr. Y.P. Lim, B.Ag.Sc.

Mrs. J. Moulden, B.Ag.Sc.

ASSISTANTS:

Mr. C. Phillips, R.D.A.

Mr. R.B. Jenkins

Mr. K.R. Henry

ENTOMOLOGY SECTION

1. SECTION ACTIVITIES:

During the year under review, the Entomology Section directed it's research resources to give greater emphasis to the sitona weevil (Sitona humeralis) problem. This weevil threatens the whole South Australian economy. It not only attacks the foliage of pasture legumes, especially the medics, but in the larval stage destroys the root nodule so important to nitrogen fixation in the soil. Populations of as many as two hundred larvae per square foot have been recorded; densities at which few nodules escape damage.

Mrs. J. Moulden commenced a full time research programme on the sitona weevil at the beginning of 1972.

Another feature of the year's activities was the control, survey and extension work carried out to protect the State from infestations of the plague grasshopper (Austroicetes cruciata) and flights of the plague locust (Chortoicetes terminifera).

Insect pests of stored grain threaten cereal exports from South Australia and the Section has also devoted a great deal of time advising the cereal industries and farmers on how to deal with the problem.

The Section is breaking new ground in practical pest control research with the development of population studies of the pasture cockchafer (Aphodius tasmaniae) in perennial pastures in the Adelaide Hills. This will enable farmers to evaluate populations of this pest so that they can use minimum pesticide applications for maximum control.

2. RESEARCH:

- 2.1 Sitona Weevil (Sitona humeralis) - P.R. Birks, P.G.  
Allen, Mrs. J.  
Moulden

During the year the Entomology Section has developed a detailed sitona research programme. Mrs. Moulden commenced duties at the beginning of 1972 and since then has concentrated on a complete literature survey and has commenced general biology studies. Larval assessment damage has also commenced.

Dense flights of sitona weevil occurred over most of the agricultural areas in November and December, 1971. Serious populations occurred on Yorke Peninsula for the fourth consecutive year and on eastern Eyre Peninsula. Populations are showing no signs of decreasing. Farmers have had to be advised against spraying because of the limited benefits achieved due to re-invasion soon after the application of chemicals because of their limited persistence. The greatest hope for a solution to the sitona problem is therefore considered to be biological control.

The Entomology Section has designed this research programme to provide the background information required by the Division of Entomology in C.S.I.R.O. which will soon commence a biological control research programme based at Montpellier in France.

Mrs. Moulden's programme will also develop a technique to screen all lucerne and annual medic lines in the Departmental breeders' collection for resistance to larval attack.

2.2 Damage Assessment of Pasture Cockchafer  
(Aphoidius tasmaniae) in Pasture - P.G. Allen,  
K.R. Henry

A sequential plan is being developed to assist in determining the densities of pasture cockchafer in pastures which are economic to treat with insecticides.

The technique classifies populations with minimum sampling time into two simple categories. One category defines where the density is sufficient to require treatment, and the other defines the density too low for treatment.

Fundamental information required to construct a sequential plan is firstly the definition of the frequency distribution of the insect population and secondly, the evaluation of the density above which it is economic to treat.

The distribution of larvae in pasture have been determined by sampling a number of infestations with a 108.5 square centimetre sample unit area using a stratified random sampling method. The infestations were selected to give a range of densities considered to be within the economic threshold level and the range of areas differing in ecological factors which may affect the distribution. The distribution of all infestations sampled closely fitted negative binomial distributions and the only factor which affected the dispersion parameter,  $k$ , in the negative binomials was larval density - the value of  $k$  increased with increased densities.

Previous trials assessing the damage caused by pasture cockchafer showed that future damage assessment studies should be carried out with grazed pastures. Towards this end a grazing trial has been set up this year using naturally infested pastures where one half the area was sprayed with lindane and the other half was left unsprayed and the density of larvae estimated. Both areas are being subjected to the same grazing pressure and differences in pasture and wool production will be used to evaluate differences between the areas.

### 2.3 Pesticide Residue Investigations - Y.P. Lim, R.B. Jenkins

DDT has been used to control many pasture and field crop pests but because of its slow breakdown it can produce undesirable residues in agricultural produce and its long continued use may ultimately present a hazard to some wild life.

Departmental policy has been to strive towards replacing DDT with more bio-degradable materials. This requires, not just a single replacement chemical, but sometimes a different one is required for different pest species or for the same species in a different host crop. For example, trichlorphon could replace DDT for the control of barley grub (Persectania ewingii), but it is substantially ineffective against the pink cutworm (Agrotis munda).

Having found a replacement insecticide, rates and times of application need to be studied and the reliability under various field conditions needs evaluation to avoid serious build-up of populations and other environmental problems which can arise from the hasty introduction of inadequately tested alternatives.

Mr. Lim has nine field trials evaluating candidate insecticides to replace DDT as follows.

#### 2.3.1 Pea weevil (Bruchus pisorum)

Trials have shown that endosulfan can replace DDT for pea weevil control and during the past year further field work has indicated that a reduction by 20% in application rates of this chemical may be possible.

#### 2.3.2 Barley grub (Persectania ewingii)

Further field trials during the year have confirmed that trichlorphon is the most economic alternative to DDT for barley grub control.

### 2.3.3 Climbing cutworm (Heliothis punctigera)

Relatively large quantities of DDT are currently used for the control of climbing cutworm in field pea crops. It is interesting to note that although trichlorophon successfully controls this pest in grazing lucerne, it is not effective in pea crops.

During the year seven alternatives were tested to control climbing cutworm in field pea crops. Endosulfan appears most promising and further testing at lower rates are now planned.

### 2.3.4 Pink cutworm (Agrotis munda)

Three alternatives, endosulfan, diazinon and chloropyrifos have been tested. The cheapest, endosulfan, can now be recommended for lucerne on dairy properties, but as it costs 80 cents per acre compared with 10 cents for DDT, it is of little use for large areas of lucerne on sheep or beef properties. The valuations of lower rates of applications of diazinon and chloropyrifos are planned.

This project is also examining pesticide residues in wild life. An area of some 20 square miles near Saddleworth was selected during the year for sampling pesticide levels in native fauna, because in this district relatively high rates of DDT have been used for many years to control insect pests in field pea crops. The area has been mapped and the various habitats defined. Twenty-nine species of birds and six species of other animals from the area have been sampled and these are now being analysed for DDT level.

## 3. INSECT PEST SURVEY & CONTROL PROGRAMMES:

### 3.1 Grain Pests

During the year under review 185 samples were identified from 95 sources where grain products were either stored or processed. Fifty-one of the samples were tested for insecticide resistance. Resistance was found in 23 samples from 12 different locations within the State. Six different species of grain pests were involved.

This work has revealed that a major resistance problem has developed in flour mills and is developing in the grain trade. The absence of alternative insecticides and continuing demands on export markets for a high standard of absence of

infestation of stored grain pests is seen as a major threat to our grain exports.

To determine whether resistant insects are building up on farms a very detailed survey has now been initiated.

### 3.2 Plague Grasshopper Control (Austroicetes cruciata)

Large numbers of plague grasshoppers hatched in the Hawker and Carrieton district at the beginning of September, 1971. Four ultra-low volume misting machines were put into operation on hire to district councils to introduce this technique which allows the insecticide to be applied without water.

During the spring a total of 154 gallons of technical maldison was applied to some 3,700 acres by landowners. Despite a government subsidy on the price of the insecticides the cost of this treatment is still very high. Experiments were therefore conducted with lower rates of maldison but these appear unreliable. Fenitrothion was found to be a useful alternative but it has no significant economic advantage.

Grasshopper densities were measured at 10 to 15 hoppers per square foot in most of the dense areas with a maximum of 20 per square foot near Belton. Large areas of hundreds of thousands of acres carried 1 to 2 hoppers per square yard; densities of flying adults were measured at up to 5 per square yard, which highlights the poorer economics of treating flying insects.

Surveys carried out at Dawson showed an average density of 0.31 grasshoppers per square yard. This represented a three- to fourfold increase over the previous year. A further increase of the same magnitude is now expected in this region because of the prolonged egg-laying again in the late spring of 1971. Surveying and control measures are therefore being planned for the spring of 1972.

### 3.3 Plague Locust (Chortoicetes terminifera)

The Section has continued to survey locust populations in the north of the State. This work has been carried out in liaison with the locust patrol service of the C.S.I.R.O. and the United Kingdom centre for overseas pest research.

Widespread heavy rain in the inland areas during mid-January, 1972 arrived only just in time to ensure the survival of large locust populations of the far west of New South Wales



and south west Queensland. Extensive migration took place, particularly in the Broken Hill area, where large numbers of eggs were laid in January. From these adult locusts developed by the end of February, 1972 and it was feared that South Australia was threatened with a major invasion. Fortunately the weather conditions were such that the main migrations moved east and south east in mid-March.

Nevertheless, significant populations of locusts were found in the pastoral country north and south of the Broken Hill line and around Loxton and on parts of Eyre Peninsula. The Eyre Peninsula infestations had arisen locally from less dense and largely unnoticed adult locusts present in those areas during January. These were probably extensions of the main locust concentrations in the far west of New South Wales.

Using specially purchased ULV equipment the Section sprayed 1,920 acres in the Upper Murray region. This project was assisted by the recruitment of four additional casual labourers. In the north east pastoral area 1,120 acres were also sprayed. This programme ceased on the 24th March because widespread dispersal of the locusts occurred and no further infestations of sufficient density were found.

A survey of the agricultural and north east pastoral areas during the autumn of 1972 showed concentrations of locusts at average densities of 1 to 2 per square yard in the Cleve and Lock to Sheringa areas. Surveys were also carried out at Pine Point on Yorke Peninsula and on the Lilydale Station in the Morgan area. Similar densities were also recorded at these sites. Further surveys showed that the less dense population of 1.0 to 0.5 per square yard were widespread throughout the northern agricultural areas and on the eastern slopes of the Adelaide Hills.

#### 4. EXTENSION:

During the year the Entomology Section conducted seven Agricultural Bureau meetings and held three field days. Probably the most successful was the field day at Craddock which demonstrated the ultra-low volume spraying technique for grasshopper control.

The Section also held four special group meetings with farmers. This supported planned extension programmes being carried out by district extension officers.

A programme to train district agricultural advisers in all aspects of grain pest control was also commenced and research officers within the Section attended special regional meetings to teach the advisers.

During the year the following conferences were attended:-

- \* The Seed Producers' Conference, Naracoorte - P.G. Allen
- \* The Quarterly Public Health Conference at Adelaide - P.G. Allen
- \* The Agricultural & Veterinary Chemicals Association, Adelaide - P.R. Birks.

Messrs. Birks and Allen have continued to serve on the following committees:-

- \* The Mosquito Control Committee, Adelaide - P.G. Allen
- \* The Rodent Research Advisory Committee, Canberra - P.G. Allen
- \* The Commonwealth & State Entomology Committee, Perth - P.R. Birks
- \* The Stored Grain Expert Committee, Canberra - P.R. Birks
- \* The Pesticides Summary Sub-committee, Canberra - P.R. Birks.

##### 5. PUBLICATIONS:

- Allen, P.G. (1971) - "Effects of Some Organic Phosphorus and Endosulfan Seed Dressings on Wheat". Aust. Jnl. Expt. Anim. Husb. 11: 556-558.
- Allen, P.G. (1971) - "Biology of *Desiantha candata* Pasc. (Coleoptera:Curculionidae) in South Australia". Jn. Aust. Ent. Soc. (forwarded to editors).
- Allen, P.G. (1971) - "Sequential Plan for Assessment of Damage by *Aphodius tasmaniae* Hope (Coleoptera:scarabaeidae) in Pastures in South Australia". Proc. 14th Int. Congr. Ent.
- Birks, P.R., Lim, Y.P. & Jenkins, R.B. - "DDT Analysis of Oat Samples from the Upper South East of South Australia". Agronomy Branch Report No. 38.

Lim, Y.P. & Jenkins, R.B. - "The Italian White Snail, Theba  
pisana (Miller) in South Australia with Particular  
Reference to its Distribution in the South East of  
South Australia". Experimental Record No. 6, pp.  
23-25.

continued in part 2