

DEPARTMENT OF AGRICULTURE, SOUTH AUSTRALIA

Agronomy Branch Report

MINI CONFERENCE

SEED QUALITY AND PRODUCTION IN CEREALS AND OTHER CROPS

WALKERVILLE

Wednesday 30th and Thursday 31st July 1975

CONVENORS: M.R. Krause, Principal Research Officer, Agronomy
B.J. Marshall, Research Officer, Crop Agronomy
D.C. Bagless, Senior Seed Production Adviser

Report No. 68

3.2 REVIEW OF CEREAL SEED SCHEMES IN OTHER STATES

S.G. Williams
Assistant Senior Agronomist

New South Wales

The N.S.W. Department of Agriculture operates a Cereal Pure Seed Scheme which is very similar to the one operating in South Australia. In N.S.W. the scheme includes wheat, oats, barley and cereal rye.

The Scheme consists of two phases of seed multiplication:-

- (i) Foundation seed production
- (ii) Registered seed production

Foundation Seed Production

Approximately two years before a new variety is released for commercial growing, a quantity of 500kg of breeders' seed is supplied for seed multiplication purposes. Of this seed 100 kg is put aside in environment controlled long-term storage and the remainder is sown for seed increase. The produce of this crop is the foundation seed supplied to registered growers for further seed increase in the year prior to release.

The Department aims to make as much seed as possible available to registered growers at this stage so that ^{they} in turn, will be able to achieve a maximum increase to meet the demand for seed of the new variety. A nominal amount of 25kg of foundation seed is supplied free of charge and the balance is supplied at a price roughly the same as the current commercial rate for seed.

In subsequent years, foundation seed is produced by drawing on the reserve of breeders' seed in long-term storage. Usually one year's production is sufficient to supply two or three years' requirements for foundation seed. Except in special circumstances, only 25 kg of seed per variety per year is supplied after release.

All foundation seed is now produced at Temora Agricultural Research Station under the supervision of an Agronomist (Seed Production) and a Cereal Pure Seed Officer. Each year, plant breeders are invited to inspect the seed crops of their varieties and to reject any which do not conform.

There have been some problems of a minor nature in getting this phase under way but it now appears to be working satisfactorily.

Registered Seed Production

Registered growers are selected by district agronomists and are located throughout the cereal growing areas of the State.

Each grower is provided with foundation seed as described previously, and he is permitted to multiply this seed through three generations. The produce of any multiplication is eligible to be sold as registered seed.

The growing crop is inspected just prior to harvest as in South Australia. If satisfactory, a crop inspection report is completed on the site, signed by the grower and inspecting officer and a copy handed to the grower.

A list of varieties and growers with seed available, is prepared following completion of inspection. This list is distributed throughout the cereal areas.

The demand for seed is greater when new varieties are first released and then declines rapidly to a stage where not all growers are prepared to continue producing seed of some varieties.

Growers usually meet in district or regional groups prior to harvest to determine a price for seed. The Department does not influence the decisions on price.

Although the scheme provides that all seed must be sold in new bags, a large quantity, particularly oats, is sold in reasonable second-hand bags. There is not a large sale of seed in bulk at this stage.

The Department stresses that the authenticity of the seed depends entirely on the integrity of the grower. They also stress that it is the grower's responsibility to ensure that the seed complies with Seeds Act standards. No laboratory testing is done by the Department prior to sale unless requested by the grower.

In addition to the normal field supervision given by district agronomists and seed production officers, registered growers are subject to visits from seeds inspectors who check on the presentation of the seed for sale and take samples for laboratory testing and "grow-on" field testing.

The Department does not sell cereal seed to anybody other than registered growers and then only in circumstances described before. Nor do they operate any subsidiary scheme to supplement the production of seed by registered growers.

As a guide to the scope of the N.S.W. scheme, the following statistics are of interest.

A. Foundation Seed Areas - Sown 1974
Temora Agricultural Research Station

Wheat	13 varieties	25 ha
Oats	5 "	10 "
Barley	3 "	4 "
Rye	2 "	3 "

B. Registered Seed Growers (1975 Foundation Seed distribution)

Wheat	128	(13 varieties to	109 growers)
Oats	93	(12	" 64 "
Barley	48	(5	" 39 "
Rye	8	(2	" 4 "

A wheat grower may also be a barley or oat seed grower and hence would be counted separately for each group. Not all growers may require foundation seed each year.

Table 3 explains Phase B of the seed multiplication procedure.

Victoria

Cereal variety recommendations are made for various agricultural regions of the State.

In the case of wheat, there are eight zones which are aggregates of defined silo delivery areas which produce wheat of predominantly similar quality characteristics and maturity type.

For barley there are two mutually exclusive zones, viz. the drier north-western part where Weeah is the only variety recommended and the remaining medium and higher rainfall districts of east-northern and southern Victoria where Lara and Residdee barleys are recommended. The production areas also line up with the silo system which receives only the recommended types, except by special arrangement.

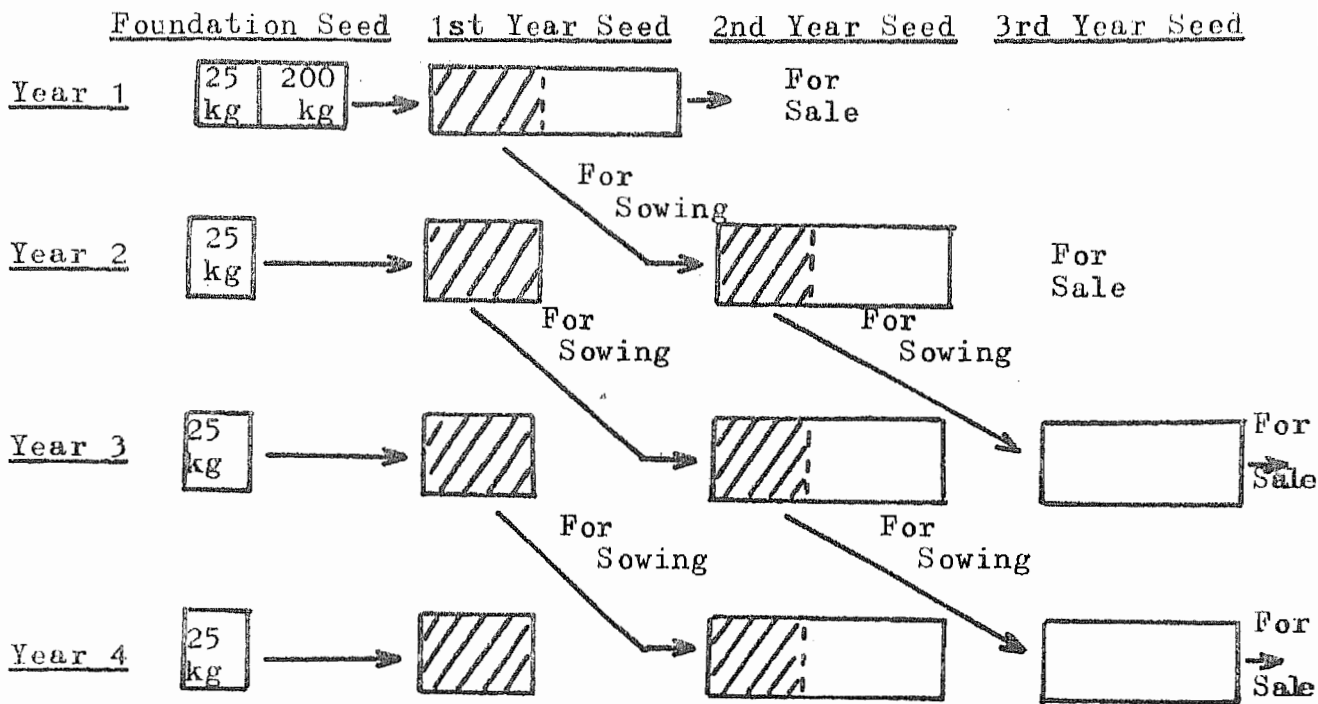
Oat variety recommendations are made on the basis of statistical districts, rainfall distribution and purpose.

Pure seed of recommended varieties of wheat, oats, barley and field peas is produced at Departmental Research Stations and Colleges. Generally speaking the centres specialise in varieties recommended for the zones in which they are located, though in some instances centres are the sole source of supply for the State.

Starting from rows sown with seed from a selection of typical heads, seed stocks are built up on the research stations to the stage where large areas are grown. They are subject to heavy roguing until the very last year when the area sown precludes such treatment. Provided the seed is of a satisfactory standard of purity and trueness to type, it is harvested as pure seed and graded under supervision. The graded sample is then subject to a final inspection after which it may be sold to farmers in small lots, generally 5 bags, but may be less if seed is in short supply. The aim is to supply the grower with a nucleus from which he can produce his own requirements for future crops.

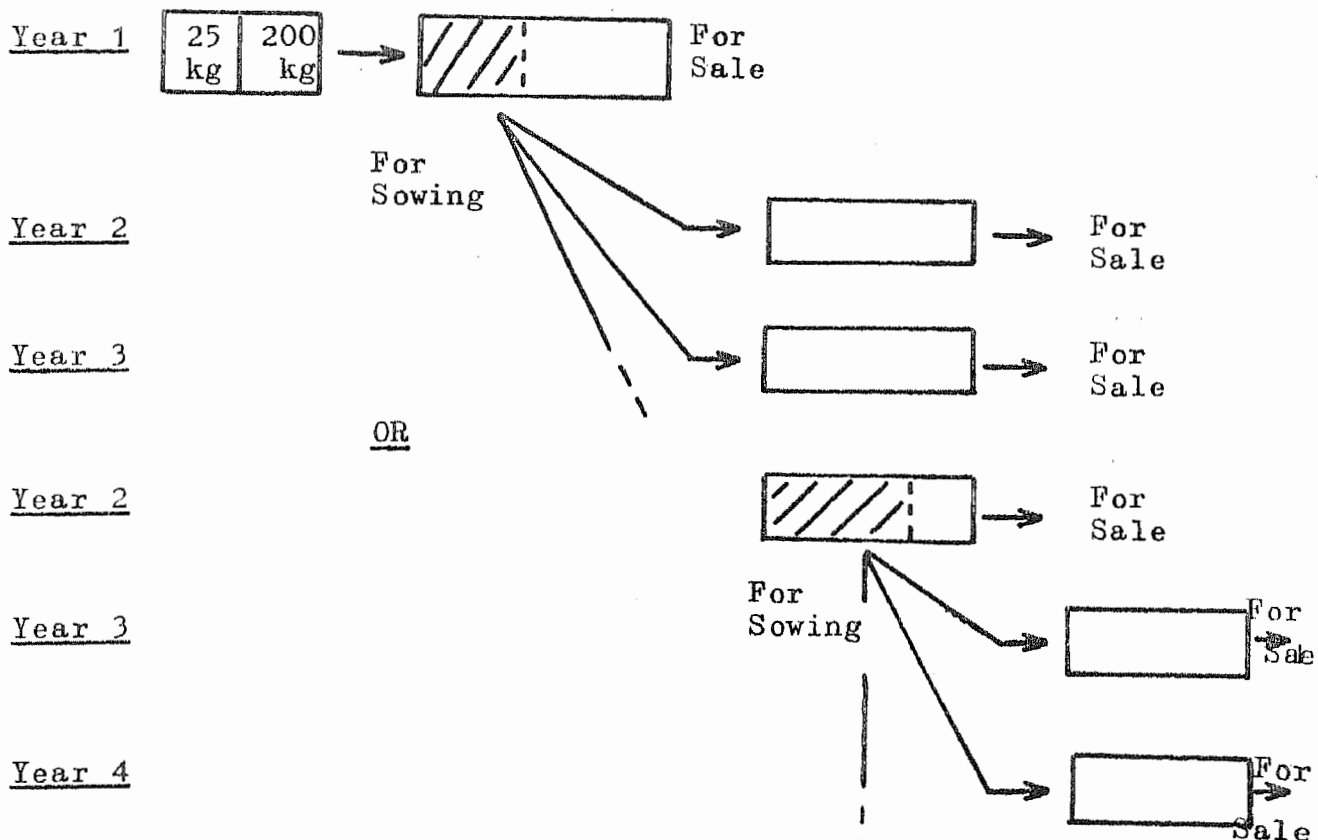
The above explains the normal scheme which has operated for many years. In 1966 it was varied to include a registered grower scheme for a new variety Summit, and was further extended in 1973 to include the variety Zenith. Several growers were registered

Table 3: N.S.W. REGISTERED CEREAL SEED MULTIPLICATION PROCEDURE



- NOTE:
- i) Surplus 1st Year and 2nd Year Seed may be sold as Regd. Seed.
 - ii) If 2nd Year Seed production is sufficient to meet demand, it is not necessary to produce 3rd Year Seed.
 - iii) 3rd Year Seed cannot be used for further Regd. Seed production.

Alternatively a grower may elect not to receive an annual allocation of 25kg Foundation Seed, but to produce registered seed from carryover 1st or 2nd Year Seed produced on the farm. For example:-



and supplied with 5 bags of mother seed each year. The land on which the crop was to be grown was inspected by an agronomist as was the growing crop. Provided the crop was of satisfactory purity and trueness to type, the growers were authorised to sell the produce as registered seed. Growers were required to purchase mother seed each year from the Department. The scheme worked satisfactorily while Summit was new, but gradually the demand dropped off and the registered growers of that variety gave up the scheme until in 1974 only one was operating. He is still participating in the registered grower's scheme as the sole private supplier of the newer variety Zenith.

At the present time the Department is considering a similar scheme for barley seed production by registered growers. It is probable that large scale short-term growers' schemes will have to be used for new barley varieties which are not compatible with existing varieties in malting.

Queensland

Wheat

In Queensland, the provision of the volume of seed wheat required by the Queensland Wheat Industry is provided by a seed wheat scheme administered by the State Wheat Board through its field staff. The Queensland Wheat Variety Committee decides in advance of the season what varieties will be accepted as "premium hard" and arrangements are then made for the appropriate quantities of seed of each variety to be produced. It is of interest that the State Wheat Board in Queensland supplies less than half of the seed required annually, the remainder being obtained by farmer inter-change or by farmer retention.

In practice, the State Wheat Board field staff inspect the growing crops of the chosen varieties for freedom from weeds, etc., and if the crops are satisfactory the seed is then accepted, graded and stored separately for seed wheat purposes. The seed wheat is purchased by the Board and a small premium is paid.

The Queensland Department feeds into the system each year a few bags of pure seed of one of the chosen varieties and this keeps the commercial crops true to type. Departmental plant breeders start from a selected plant of one variety each year and the seed is increased for four to six years before handing over to the State Wheat Board for commercial increase. During this four to six year period the increased areas are rogued for off type plants.

Barley

The Queensland Barley Marketing Board has maintained a one variety malting barley industry and at present, the variety is Clipper. This does not mean of course, that Clipper is the only barley variety grown but it is the only one which is acceptable for malting.

Because of the one variety situation for malting purposes the provision of pure seed is simpler and this is again handled by the Barley Marketing Board using selected crops. Departmental co-operation is available as required.

Oats

Although a considerable area of oats is grown each year it is used almost exclusively for grazing purposes. There is, therefore, little oat seed available for planting. Most oat seed for planting comes from southern states.

Many of the southern oat varieties are susceptible to crown rust, stem rust and leaf rust when grown in Queensland, especially in the moister sub-coastal areas. For this reason resistant varieties have been introduced from overseas and an attempt is being made to produce seed for sowing under certification conditions. Minhafer, Camellia, Saia, Bentland and Algerian are the varieties involved.

The usual certification rules and conditions apply and when a reasonable quantity of certified seed has been produced it is handed over to the Seed Industry Association for further increase as approved seed. The approved seed is subject to inspection and if satisfactory, it is sealed before being made available for sale to farmers.

At present the certification oat scheme is having considerable problems with wild oats infestations.

Western Australia

Seed of a limited number of recommended varieties is produced on Departmental research stations for direct sale to farmers, normally in limited quantities of about two bags. The aim is to supply growers with a nucleus of seed for their own further bulking.

When pure, pedigreed stocks of a variety are available it is sold as pedigreed seed. Where for some reason complete purity cannot be guaranteed, or with some new varieties which may still show genetic variability, it is sold as selected seed.

The West Australian Department does not have any system of registered or co-operating growers. No seed is released from research stations prior to full general release.

Tasmania

Up until this coming season the Tasmanian Department had run a Cereal Certification Scheme in which foundation seed was produced on Departmental research stations and this was multiplied by certified seed growers. Seed was inspected during the growing season for purity and the absence of objectionable weeds and a minimum standard of crop vigour was expected. The seed

also had to comply with the Seeds Act at the time of sale. This Act requires minimum standards of germination and the absence of certain weed seeds.

In practice it has been found that because there is only one stage of farmer multiplication, seed crops were rarely rejected. In most cases these crops would also have been rejected under the provisions of the Seeds Act, usually for the presence of prohibited weed seeds. As the Department was faced with bringing in charges for its certification schemes, it was decided to drop the inspection of the final stage of multiplication of cereal crops, rather than place a charge on this activity.

The multiplication of seed on the research stations is normally over four seasons commencing with single head selections. Each stage is carefully rogued and they have experienced little difficulty in maintaining purity because of the small number of varieties grown in Tasmania. It is difficult to determine the proportion of the cereal crops grown from certified seed, but it is estimated that certified seed or certified seed once grown is used for over 70% of the crops. During the past four to five years the amount of foundation seed of each variety distributed by the Department has approximated to 5% of total seed requirements. Production from this quantity of foundation seed should in theory, provide sufficient certified seed to satisfy the needs of all commercial growers. The present standard of seed production, rate of multiplication and method of distribution are such that eliminating supervision of the final stage of multiplication should have no adverse effects.

The varieties produced on research stations as foundation seed are:- wheat-Mersey, Isis; barley-Proctor; oats-Blythe.

Table 4 : INTERSTATE CEREAL SEED PRODUCTION SCHEMES - IN BRIEF

STATE	SEED PROVIDED BY RESEARCH CENTRES OR AGRICULTURAL COLLEGES	TYPE OF SCHEME	CROP INSPECTED	SEED TESTS DONE	NO. OF YEARS WHICH SEED CROPS CAN BE GROWN AFTER OBTAINING PURE SEED	CROPS SOWN	REMARKS
N.S.W.	Temora Agricultural Research Station only provides foundation seed	Registered Grower Scheme	Inspected just prior to harvest	Only on request by grower	Three	Wheat, Barley, oats, cereal rye	The Dept. doesn't sell to anyone except registered growers
Vic.	Research Centres & Agricultural Colleges provide pure seed	From 1966A Limited number of registered growers of wheat only Zenith. Registered grower scheme for barley being considered	Land prior to sowing & growing crop inspected.	If in doubt seed tested for purity & germination	Two	So far only wheat.	More pure seed is provided direct to commercial growers
Old.	D. of A. provides pure seed periodically to Wheat & Barley Boards	Wheat & Barley Boards distribute seed to commercial growers. No system of registered or co-op. growers	Commercial crops inspected for seed by Boards' field staff	Not done. If growing crop satisfactory seed is purchased by Boards at a small premium	Indefinite but pure seed from D. of A. injected into the system periodically to maintain standard	Wheat, recommended varieties, Barley, Clipper	Seed grade and stored separately by Boards
	D. of A. provides pure seed of oats	Oats Certification Scheme and Approved Scheme	Yes	Yes	-	Oats, overseas varieties	Seed Industry Assoc. increases certified seed as approved.

STATE	SEED PROVIDED BY RESEARCH CENTRES OR AGRICULTURAL COLLEGES	TYPE OF SCHEME	CROP INSPECTED	SEED TESTS DONE	NO. OF YEARS WHICH SEED CROPS CAN BE GROWN AFTER OBTAINING PURE SEED	CROPS SOWN	REMARKS
W.A.	Research Stations provide pedigree or selected seed	No system of registered or co-op. growers. Seed sold direct to commercial growers	No	No	-	A limited number of recommended varieties of wheat, barley, oats	Aim is to supply growers with a nucleus of seed for their own bulking
Tas.	Foundation seed provided by research stations	Certified growers	To be discontinued in 1975-76	Yes	One	Wheat, barley, oats	Certified seed or certified seed once grown used for sowing 70% of all crops

4.1.1 REGISTERED SEED GROWERS' SCHEME IN WHEAT & BARLEY

G.D. Webber,
Senior Agronomist

The registered seed growers' scheme was started in 1961 and has been running for 14 years and has supplied a nucleus of good seed of wheat and barley to the cereal industry during this time.

Basic seed has been supplied to 16-20 registered growers around the State. Approximately 25 tonnes has been distributed each year, this in turn has made available an average of about 625 tonnes for distribution to commercial growers each year.

So in reviewing the registered seed growers' scheme, it would seem that since 1961 something like 2,450 tonnes of seed has been available.

The History of Registered Seed Scheme:

During the late 1950s a need developed for a supply of seed to supplement the quantity available from Roseworthy Agricultural College and Research Centres. In particular, this applied to seed wheat.

Three changes were taking place at that time. All three had some influence on this requirement.

1. Up to the early 1950s crop competitions provided a good source of seed. Judges of competitions recommended for seed those entries which were true to type and free from weeds and disease. Interest in competitions waned between the early 1950s and 1960-61 when the last State Championship competitions were conducted.
2. South Australian Co-operative Bulk Handling began operations in 1955 and the change to handling grain in bulk took place rapidly. By 1960-61, 588,000 tonnes were delivered in bulk. The change to bulk handling increased the difficulties of keeping seed free from admixture. To overcome this growers tended to purchase seed in larger parcels to sow whole paddocks instead of small "build up" areas as had been the practice.
3. Overseas buyers were looking for wheat of better quality and uniform appearance. The Advisory Committee on Wheat Quality recommended a drastic reduction in the number of varieties grown in South Australia. Recommendations were made for 14 districts and included only 9 varieties. This move was designed to improve yields, quality and uniformity.

The Department conducted a successful extension programme aimed at achieving the objectives of the marketing authorities.

It was with this background that the registered cereal seed scheme was started in 1961.

Seed Supplies to Registered Growers:

Roseworthy Agricultural College and Minnipa Research Centre, who were previously responsible for the supply of seed wheat and oats to farmers throughout the State, became suppliers of seed to registered growers as a first responsibility. The registered growers multiplied the seed and distributed it to commercial growers in larger quantities. Turretfield Research Centre similarly has distributed seed barley to registered growers.

In general this system has worked quite well with Roseworthy Agricultural College being the main supplier of basic seed of wheat and Turretfield of barley.

Conditions of Registration:

The crops grown by registered growers and inspected by district agronomists before harvest - when they are passed for registration or rejected.

Obviously purity of seed must be maintained while it is being handled by the registered grower. For this reason they are required to comply with certain conditions. The following statement is required to be signed by the registered grower and witnessed by an officer of this Department. (A copy of the form is included later).

Distribution of Seed by Growers:

Growers distribute seed privately at a price agreed by the registered grower and the buyer.

Distribution of Growers:

It has never been difficult to locate growers interested in producing and selling seed. The appropriate number seems to be around 16-18 for the State for wheat. There are 16 seed wheat growers at present (1974-75) and these are situated as follows:-

Upper Eyre Peninsula	2
Eastern Eyre Peninsula	1
Southern Eyre Peninsula	2
Yorke Peninsula	1
Lower North	3
Upper North	3
Lower North	1
Northern Mallee	2
Southern Mallee	1

In its eleven years of operation, 41 growers have been involved in seed wheat production. Ten of these have operated for 7 or more years.

Barley seed production has been a little different. Until the advent of Clipper and Ketch a hard core of 6 or 7 growers located on Eyre Peninsula, the Murray Mallee and in Northern districts, produced Prior and Noyep seed. This number increased to 18 for Clipper in 1969-70 and to 17 and 23 respectively in 1970-71 and 1971-72 for Clipper and Ketch. However, the number of registered barley growers in 1975-76 was 10.

Approved Seed Crops:

In cases of emergency or when seed supplies of certain varieties have been in short supply, the Department of Agriculture has been prepared to approve crops for seed, e.g.:-

- (1) 1967 drought - crops in favoured areas were inspected and lists of approved seed crops released.
- (2) In 1974 because of the rust situation crops of Condor and Kite were inspected and approved in a similar manner.

Discussion

A germination test result will be included on the Analytical Report of Purity given to Registered Growers. The crop will be provisionally registered and the purity and germination results will be provided later.

Registered growers are required to keep records of seeds sales but generally the Department does not sight these.

SOUTH AUSTRALIAN DEPARTMENT OF AGRICULTURE
REGISTERED CEREAL SEED PRODUCTION
AGREEMENT

Name of Registered Grower

Address

Type and variety of Cereal

Statement by Grower

I agree to observe the following conditions concerning the growing, harvesting and distribution of pure seed.

1. The seed supplied from a Government Centre will not be mixed with any other seed and will be sown on well prepared land which has not grown a cereal crop, other than of the same variety, in the previous season.
2. Before sowing the seed, the drill or combine will be carefully cleaned out. Where possible, the seed will be sown immediately after the farm sowings of the same variety.
3. The crop will be open to inspection by officers of the Department and groups of farmers, e.g. Agricultural Bureaux.
4. All possible precautions will be taken to keep the crop free from weeds and impurities.
5. At least 60% of the grain harvested from the crop will be made available for sale as seed and will be distributed as well as possible according to demand, except where arrangement is made between the Department and grower to use seed of a variety in short supply for multiplication.
6. If the crop is rejected for seed by an officer of the Department of Agriculture following an inspection of the crop or the harvested grain, the grain will not be sold for seed.
7. The produce of any other crop of the same variety will not be sold for seed.
8. Before harvesting or subsequent handling operations begin, the header and bulk handling and grading equipment (if applicable) will be carefully cleaned out. Where possible, harvesting & etc., of the crop will be done immediately after the harvesting and etc. of the farm crop of the same variety.
9. Grain which is to be sold as seed will be put into new sacks.
10. A record of details concerning the crop and sales of grain will be kept as requested by the Department of Agriculture.

.....
Grower's signature.

ness:
Officer of the Department of
Agriculture.

4.1.2 FOUNDATION AND REGISTERED SEED

I.M. Rice
 Technical Officer - Plant Breeder
 Roseworthy Agricultural College.

Mr. Webber has outlined how the Registered seed scheme has operated in South Australia since 1961. I will now go into a little more detail as to how we go about producing this basic or elite seed, both at Roseworthy and Turretfield (I trust Mr. Nourse will put me straight on any inaccuracies I might make about operation at Turretfield). Following my outline of how Roseworthy and Turretfield fit into the picture I will make a few brief general remarks about the scheme as we see it at Roseworthy.

Production of Foundation and Registered Seed at Roseworthy -
 Can be divided into 3 stages.

Stage I - Selection of Mother Seed

Mother seed is the elite seed which is used to sow the Foundation Blocks and is the most important stage in the programme. If the Foundation block of the variety in question is true to type and can be satisfactorily rogued to give a high standard of purity a strip is left in the centre of the block at harvest. This strip is very thoroughly rogued before reaping with a "Hege" plot header. The area left has to be large enough to enable one bag (75 kg) of clean graded seed to be obtained. If there is any doubt as to the purity of the Foundation Block as well as the above procedure 1,000-2,000 heads are selected from the centre of the block. These heads are threshed separately and sown in individual hill plots. This system makes roguing very easy each off type hill plot is easily removed and the area then harvested in bulk. We believe this system overcomes cross-pollination problems which can and do occur, probably more readily with semidwarf varieties the conventional Australian varieties. G&bo brown heads.

Stage II - The mother seed is treated with Vitavax 75 for loose smut - Ustilago tritici and stinking smut Tilletia - spp. The area of the Foundation block depends on the demand for the variety and the amount of seed available but is usually 0.5-2.0ha. Foundation blocks are inspected and rogued to remove off type plants several times prior to harvest. The Foundation seed is reaped with a conventional header. This seed is graded and treated with the commercially recommended bunticide (1975 LE SAN ELL). Two bags (150 kg) is held in reserve in case of crop failure or loss from some other cause, e.g. bushfire, bad weed infestation. One or two bags (75-150kg) is sent to Minnipa Research Centre to carry on Stage III on Eyre Peninsula.

Stage III - Registered Block

The remainder of the Foundation seed is sown into a Registered Block from 2-15 ha in area depending on the demand for the variety. The area is inspected several times and rogued at least twice prior to harvest. This is the seed which is sold to Registered Growers and also used to seed the Commercial

seed area (i.e. seed for sale as commercial seed to South Australian farmers). Roseworthy also acts as a Registered grower and produces seed for sale to Commercial Wheat growers.

Turretfield Pure Seed Production

Stud Rows - 100 single rows are seeded with seed from 100 single plants selected from the previous years stud rows. This seed is sown through alternate rows of a small seed drill. Any row which is not true to type is rogued out and the rows remaining are harvested in bulk, obtaining up to 3 bags.

Selection Area - The seed obtained from the stud rows is seeded into a selection area of approximately 4 ha. The area is rogued prior to harvest and the seed harvested is

1. sold to Registered barley growers
2. used as a bulk seed increase area in the following year for sale to farmers.

A Brief Comparison of the Roseworthy & Turretfield Method of Pure Seed Production

The Pure Line (Turretfield) method of Pure Seed Production was used at Roseworthy until 1973, different terms were used but the method was basically the same, except that with barley it seems that demand for seed from Registered growers is small enough that it can be met from the Foundation or selected area stage. For wheat varieties for which there is little demand this is also done at Roseworthy, but not for most varieties in popular demand, for example Halberd for the first few years after its release and at present Condor and Kite. Some plant breeders are of the opinion that it is easier to keep varieties true to type by careful roguing of selected Mother Seed area and if necessary 1,000 heads selections in Hill Plots in blocks than the pure line method. Some barley growers suggest that Clipper is somewhat different now than when it was released. It would certainly be interesting to grow some old viable seed and compare it with the Clipper being grown at Turretfield today.

Summary In recent years there has been little or no comment, from the Department of Agriculture, Registered or Commercial growers as to how the Pure seed scheme is being operated and administered. The few complaints which have been made to us have been of a minor nature. Only one complaint has been made to Roseworthy regarding purity or contamination. This complaint was made quite some time after harvest and could not be substantiated. We would appreciate being told immediately any grower has any comment about the quality of seed which came from Roseworthy. The sooner any complaint is made to use the sooner we can investigate and rectify it.

The purity of newly released varieties (and here I am particularly referring to Condor and Kite) is one which we as producers of basic seed will probably receive some criticism. The only Condor and Kite wheat which we at Roseworthy College could purchase following the release of these varieties in New South Wales was from a Registered Grower in N.S.W. There seems to be some reluctance from breeding institutions interstate to provide basic seed to interstate organisations. The result is that the seed which we will be able to supply from Roseworthy will not be of the purity which we would normally aim to achieve. However I feel we had a moral obligation to the Commercial wheat grower in South Australia to provide him with some rust resistant alternative in 1975 in view of the devastating rust epidemics of 1973 and 1974 regardless of whether the genetic purity of these varieties was up to apparently acceptable figure of 98% or not, after all it is viability of the commercial wheat grower that determines whether I have a job at Roseworthy College or whether the Registered growers can sell their seed. Of course we are doing everything in our power to improve the position but it will be a year or two before it can be rectified. The same applies to the variety Egret. Condor and Egret are both varieties which are not genetically pure.

The cost of producing pure seed is high, thorough cleaning of combines, headers, augers, trucks, graders, silo takes many hours of painstaking work as does the exacting job of roguing. It is difficult to find suitable personnel to do this type of work, but the wheat industry has seen fit to provide finance for a Field Assistant whose main role it will be to carry out this work under my supervision and we have been able to fill the position with a very suitable person.

I would like to thank the Department of Agriculture for the invitation to speak at this conference and hope that this conference will lead to better liaison between all sections of the cereal seed industry.

Discussion

There is a need for this state to keep abreast of developments in cereal breeding and testing in other states. This comment was directed toward the situation of Condor and Kite where large amounts of seed was brought in from interstate. It is believed that the present scheme is keeping up with all aspects of breeding and testing of new varieties interstate by way of the Interstate Variety Trials, a co-operative testing programme in which the advanced crossbreds from all breeding programmes in the southern states are tested together.

Condor was registered in October 1973 which gave no time for seed to be built up in South Australia ready for the 1974 season. The N.S.W. Department of Agriculture was building up Kite and Condor seed ready for release but the other State Departments of Agriculture had not been advised of the pending release of these varieties.

4.1.3 CEREAL SEED PRODUCTION IN SOUTH AUSTRALIA - A GROWER'S VIEWPOINT

W.E. Hodgson
Registered Wheat Seed Grower

My father and I have been registered wheat growers at Georgetown since the scheme began, and at present are one of 16 registered growers in the state. Last harvest, we filled nearly 200 orders to farmers, many of whom are regular clients.

The existing registered scheme for wheat has operated very well except for the loss of clients after the first year of a new variety. For example, a registered grower receives an average of only 10 bags of wheat from Roseworthy College, which will supply him with about 300 bags of seed for sale the following season.

The following season a registered grower is able to obtain an almost unlimited supply of seed from Roseworthy which enables him to grow a large area to supply the farmers in the coming season. The demand for the wheat during the second season is decreased due to the original clients obtaining permits from the Australian Wheat Board and selling their wheat usually at a lower price because in most cases, it is sold in bulk straight off the header, therefore eliminating freight and Co-operative Bulk Handling charges. A good example of this was Halberd when it was released. In the second year I was left with a carry-over of seed.

During the past years as a registered grower, and to continue the patronage of my clients, there were the costs and conditions of growing the seed I had to meet.

I have carefully selected ground which has not been cropped in recent years with barley or a different variety of wheat. During seeding, a considerable amount of time is lost in extensive cleaning operations to remove any stray grains from the combine and the tray of the truck. All selected paddocks are sprayed with a pre-emergent chemical to ensure good weed control. Later when the crop is fully tillered it is sprayed with 800ml of Amine 2,4-D per hectare to ensure there are not broad leaf weeds present at harvest time.

Seed crops are inspected by the Department for purity, weeds and diseases before harvest.

At harvest time about 6 hours is spent cleaning harvesting equipment between varieties. If barley is grown on the property, it is reapt by a contractor so as to ensure there is no barley in my header.

We have extensive bulk storage facilities adjacent to our seed shed to make it possible to grade and pickle with our own seed grader, all the seed grown on the property. This seed is either placed in new branded cornsacks, weighed and sown by machine, or immediate delivery is arranged in bulk for those farmers who require their seed this way.

There are a lot of costs involved in producing registered seed. To make it pay, you have to get in big and quickly before permits become available to all farmers.

Will the Department be keeping an earlier watch on new wheat varieties from the other states so that registered growers will have ample supplies when farmers first require these varieties?

I feel that the only way to make a successful registered seed scheme is to have new wheat varieties from interstate for registered growers and not just varieties bred in South Australia.

This will help the emergency situation with rust resistant wheat where some farmers crops were approved, but where many approved varieties as well as recommended varieties came from unknown sources.

I would like to mention quality. A number of my clients purchase new seed of the same variety every 3 years to ensure a true strain. Is the Department doing enough to encourage other farmers to improve the standard of wheat by purchasing new seed?

The question of certified cereal seed has been raised recently. To date, I can say that the registered wheat scheme has proved itself well. A seed grower must realize that to operate a successful business he cannot afford to grow and sell seed of an inferior quality. I do not see how certified cereal seed will improve the scheme. I mentioned costs earlier, the costs of seed are high enough! Certification will increase costs. It will mean more bulk storage and larger seed sheds to store grain while waiting perhaps 3 weeks for tests to be done.

Under the present scheme, most seed is graded and pickled at the time of harvest, and clients can pick up their seed almost immediately, limiting extra handling.

Will those registered growers who have not got their own seed grading equipment, have a guarantee from seed grading contractors to re-clean their seed if it does not meet a certain standard? There is a health hazard in re-grading pickled grain.

What is going to happen to the uncertified pickled grain?

In place of any certified cereal seed scheme, perhaps there could be a 2 year trial period where only registered growers are issued with seed permits. If the farmers show a demand for certified seed after this period, it could be reconsidered.

It is important that all seed growers be involved in any changes that take place.

Finally, I would like to see a registered grower committee formed, which could meet once or twice a year with the Department so that farmers needs are known. Also, we could work more closely together in the future.

4.1.3 CEREAL SEED PRODUCTION IN SOUTH AUSTRALIA - A GROWER'S VIEWPOINT

Written by the late G.H. Jericho
Registered Barley Seed Grower

Read by: H. Broad
Registered Barley Seed Grower

I have always been interested in improving the yields and seed of barley, and in the use of trace elements in achieving such improvements. Much of the credit for this goes to Mr. Frank Pearson who guided my early farming years in the gas-producer days of the early forties. Barley yields have increased greatly since those days, but I doubt if many farmers realize and appreciate all that has been done - and is still being done - by the dedicated team of plant breeders and researchers in our state. I always enjoy the field days at Roseworthy, the open days at the Waite, and while the organisers seem satisfied with the attendances at these days, I think it is a pity that more farmers don't take a bigger interest in the work that is being done to improve greater pasture growth, and pasture species, better yields and better quality of cereals with improved varieties. Of course, seasonal conditions always play a big part in some of the problems met with, but these must also be reckoned with in our approach to the various situations dealt with.

As a seed grower of barley, I have seen many changes in the varieties, and I watch these with a great deal of interest. For over thirty years now, I have been involved in growing experimental trials for the Department of Agriculture, and this has been a valuable exercise. Many times I have wondered why certain varieties - known only by their numbers - have been persistently included in the trials, and taking up valuable room, but I know that they must all definitely prove themselves unworthy before they are tossed out as of no use to the industry. Some trials looked very exciting at first, only to show that much more research was needed before the variety could be accepted for sowing regularly. The release of Clipper was a milestone in the barley improvement programme, and farmers appreciated the breakthrough. Unfortunately, many farmers have short memories. They tell me that Clipper barley is not good for pig feed, that the stubble has no appeal to their stock, that it makes them cough and itch, but they forget the nasty hot windy days of other harvests, when they have stood helplessly by as their entire crop of Prior has shaken to the ground, and a whole year's work has ended up in sheep feed only. At least there is no total seed loss from their Clipper crops.

A seed grower must be extra careful with the cleaning down of his machine between the harvesting of the varieties of barley sown on his farm. This, of course, takes up valuable time, as there are so many places where seeds can lodge and stay put. I feel that manufacturers of farm machinery would do well to improve harvesters of grain, so that the cleaning down is brought to a minimum. I am continually looking at machinery with a critical eye, and at various times have made suggestions to manufacturers for improvements, but these have been brushed aside. The alterations would add too much cost to the machine

and sales would be affected as a result - but they fail to realize that our cleaner seed would ultimately improve our total output of grain in all areas, as the percentage of foreign matter would be minimal.

When I see how careless some farmers are about their crop growing and harvesting, I wonder if it is worth all the trouble I and other seed growers take to keep our crops pure. They fail to realize that with a little more care, their seed would be good for years, well rewarding them for those extra minutes at seed time and harvest. Some farmers do not pay enough attention to keeping their land clean. They graze out their barley stubbles immediately, then let the stock wander over the area they intend to crop the following season. Where farmers run cattle, you will invariably see odd plants of barley gone to seed, or barley in the droppings, and when these are left on the wrong side of the fence, the trouble begins. I have been involved with judging barley crop competitions in our adjoining district, and I mark down any crops with any stray heads of barley or wheat, as well as the other points of trueness to type, workmanship, etc. While in many instances I did not supply new seed, the farmers up-graded their seed from the other farmers in the area, and their samples have improved as a result. Some of the farmers still grow six-row barley, and they will be plagued for years with these strays in their crops. The mice, I am sure, are the offenders here - they store the grain underground under stones, and occasionally the odd seed not eaten is ploughed up and germinates, and the battle is on again.

I have many regular seed buyers, who club together and buy clean seed every two years, and who say this is the best way to keep their grade of seed up. I have made up returns each year, and present these to the Barley Board, and I think they could easily keep a check on growers whose crops need upgrading. The classifiers must see these samples, although I realise that 150 grams of barley could represent anything from 15-150 tonnes of grain, and they could advise the growers accordingly. I know the grain judges at the Adelaide Show cast critical eyes over the samples presented to them for judging, and I feel the experienced classifiers could do the same, in the interests of clean seed.

In the case of overseas trading, I think that for the benefit of seed-growers we need to have our crops inspected for other than trueness of types. The first time I sold a parcel of 25 tonnes of seed barley to Greece, I was dealing directly with the company, and not having had any previous experience with exporting, I could have avoided some of the problems I encountered, if this had been done. This year I am again involved in a similar experience, and it would seem to prove that we must get our cereals inspected by a pathologist, with an eye to our seed sales overseas. They are aware of the various diseases to be found in cereals, and we cannot blame them for wanting only the best and cleanest and healthiest seed they can buy.

One of my problems each year is seed cleaning. I employ machinery for seed cleaning from a well-known grading company. While the machine is in most cases effective, the work is only ever as good as the operator. Because it is essential to my seed-growing business that the grading and pickling are as good as possible, I never let an operator start his contract with me, until I am satisfied that his machine has been thoroughly cleaned after his previous job. While most operators are most co-operative after I have explained my position, some feel I am unnecessarily concerned. They feel that by the time they have driven over the rough roads in the area, there would be no chance of any grains being left on their machine. Actually, I have only ever rejected 40 bags of seed barley, and this happened because one chute had been blocked, and there was a possibility of foreign seed in my sample when he tipped it back into the machine. Maybe he was right when he vowed it had happened here, but of course I could not take any chances. The cost of grading is going up and up, and I am considering buying a pickling arrangement that will fit either on the header, or on the end of the auger, so that I can pickle it as I need it, or in some slack period. My header will do an excellent job of cleaning if I wish to go a little slower, and adjust the sieve and wind. Doing my own cleaning would save me several hundred dollars a year. Then, too some operators will put three bushels in a bag, but some others fall short by quite a margin. This is again extra work for me, as I have to make adjustments with the farmers as they buy the seed, and necessitates an apology for a fault not my own.

When the grading and pickling is done, I have a pick-up day, when farmers can come at any time for their grain. This saves me so many wasted precious hours as would happen if they all come whenever it just suits them, and I am out in the paddock and have to come back especially. This has worked out very well, and of course, if it does not suit the farmer that day, he will make special arrangements for a further mutually acceptable time.

When I send seed on rail or road transport, I usually request that a tarpaulin be put on the floor of the truck, so that in the event of a bag being broken during shunting or loading, or if the seed has to travel with other goods, the seed is at least protected from contamination. Then, too, if the railways employee sweeps out the truck while there is still grain in it, at least that on the tarpaulin is safe. When I had to send 150 bags of seed to the Research Centre at Esperance in W.A., they were most emphatic that it had to be sent by road transport, so they could be sure it would not leave the truck from when it left my farm to when it was unloaded at their Centre.

While I always use the best quality jute cornsacks, there can still be accidents. I usually double-bag any seed that has to go to N.S.W. by rail, and I always sew them again with flax sewing twine, as I can't rely on that sewn by machine thread off the grader. I am continually surprised at the poor quality sacks that some seed suppliers use to sell their Condor or Kite wheat in, and even Turretfield supplied me with seed this year in what I would call a second grade bag.

A few years ago, I had a brush with E.T.S.A. One of the vehicles they were using to construct power lines through my property, I stopped for an inspection. I took the keys from the vehicle - much to the surprise of the driver - and had a thorough inspection while he couldn't run over me! I collected all the various seeds I could find, and had them identified later, and there were at least eleven weed seeds that were not growing on my property or the surrounding farm. The driver tried to assure me that he had just picked them up from surrounding farms, because his vehicle had been cleaned before he left the depot that morning. The Department of Agriculture identified the seeds, and took several photos of the samples. Farmers in our area have found caltrop on their farms, and did not know from where it came until I enlightened them with an account of my experiences. I had put up much opposition to having the power lines run through my property, and was threatened with a caveat if I did not sign the easements, but I am definitely the loser if noxious weeds appear on the farm. One concession the E.T.S.A. have made, and that is, that when they need to do an inspection of that section of the line running through my property, I take them through in my vehicle, and I am happy to say, they have always honoured that agreement. I treat stock agents in the same way, and I am very sure that, but for my vigilance, I would have many more problems with keeping my seed pure.

Another problem that must be affecting the quality of seed, is leaf scald. This, and the barley grub, and other viruses which have yet to be identified, are still causing many headaches. Last year I did not do any crop spraying at all, and I think it paid me to take a chance and wait for more research to be put into the problem of safe sprays and new chemicals to control the barley pests. D.D.T. is still the most effective spray, but unfortunately so many farmers abuse its uses. Recommendations for Endosulfan did not prove satisfactory, and many farmers in our district just put a lot of chemical to the wind. They could have done damage to the insects in the area, and I was relieved that the chemical drifted away from my rape seed crop, where the lady birds and bush wasp do such a good job in controlling the pests that are present in the crop. I believe strongly in biological control of pests, and I would welcome much more research being done in this avenue of pest control.

I would like to conclude by thanking the officers of the Department of Agriculture for all the work they do to improve the barley seed in our state. This is often a painstaking and lengthy procedure, and few people realise just how much time and effort is put into just this one aspect of farming. I like to think we have a good reputation for seed-growing, and I trust we will always try to keep it this way.

4.2.1 THE CASE FOR SEED CERTIFICATION IN CEREALS

D.C. Ragless
Senior Seed Production Adviser

1. Aim

- 1.1 Provision of schemes for production and identification of seed of high genetic quality of either diverse or non diverse types.
- 1.2 Production and identification of seed free of noxious and objectionable weed seeds.
- 1.3 Production and identification of seed free from seed born disease.
- 1.4 Production and identification of seed meeting minimum standards of laboratory germination.

2. Procedures

Many people in the cereal industry see certification as very complex and just a little mysterious. I would like to clarify the guidelines which determine the procedures for effective operation of a certification programme.

- 2.1 Reproductive methods of variety in region of production.
- 2.2 Quality needs and demands of the consumer.
- 2.3 Ability of the producer to economically meet 2.2
- 2.4 Whether the seed is intended for further multiplication or not.

Participation in certification schemes in Australia is voluntary for growers, processors and buyers.

In drafting procedures to achieve the aims of Certification it is essential that schemes be kept as simple as is possible. I have listed the following procedures to illustrate that they can be complicated,

1. Specification of Stock seed.
2. Supervision of Establishment.
 - 2.1 Pre cultivation inspection.
 - 2.2 Inspection of machinery for cleanliness.
 - 2.3 Collection of label and seal from stock seed.
 - 2.4 Supervision of Planting.
 - 2.5 Seedling Inspection.

3. Field inspection for weed freedom.
4. Field inspection for disease freedom.
5. Field inspection for varietal purity.
6. Non harvest year registration.
7. Supervision of harvest.
8. Uncleaned seed sampling.
9. Supervision of processing.
10. Sampling of cleaned seed.
11. Labelling seed
12. Sealing seed.
13. Testing samples in laboratory for:-
 - 13.1 Germination
 - 13.2 Physical purity
 - 13.3 Disease
14. Testing seed samples in field plots.
15. Release of seed for sale.

Production schemes for seed of high class (Basic) varieties in South Australia use all of the above. By contrast, lower class varieties only use half of them.

Mr. Max Jongebloed yesterday said that Hannaford graders could not be used for Certification of cereal seed. I am not aware of any reason why they could not be used. Mr. Terry Heard suggested that distinct varieties were the only ones which could be certified. Non distinct varieties were thought to be trouble for seed certification. I must disagree for I consider that the varieties least needing certification are the distinct ones, and the non distinct ones are most in need of certification.

Mr. Heard also suggested that we had different seed schemes to comparable overseas countries. I agree and must add that I personally see this as no reason to change. If we change, it rather should be on the basis of our industry needs. I might add that one reason certification has never been given high priority in Australia for cereals is that our supply of cereal seeds has traditionally been by farmers saving their own seed instead of a merchant supply system, as in Europe and North America.

Costs

Yesterday Mr. Rodda mentioned an increase of 20-30% for certified seed may eventually be accepted by farmers and Mr.

Heard suggested that increases of 40% and greater applied in other countries.

If fees similar to current fees for our herbage certification schemes were charged for cereals certification this would add only approximately 15 cents per bushel to production costs for direct fees for certification. It could be argued that many growers would have to produce a better article and this would cost more. I would argue that present Registered growers could easily achieve certification standards and any that needed to adopt new standards would recover the costs of these in higher yields.

4. Benefits

- 4.1 Protection of Consumer needs, by schemes for the production and identification of quality seed.
- 4.2 Encouragement to the grower and vendor of quality seed by providing an official nationally, and internationally recognised quality endorsement. This aids selling in some markets and is a prerequisite in some countries. It also enables higher profit margins. Compare added costs of production with increases in prices for certified seeds.
- 4.3 Prevention or restriction of the spread or introduction of seed-borne diseases.

4.2.2 THE CASE AGAINST SEED CERTIFICATION IN CEREALS

M.R. Krause
Principal Research Officer
(Agronomy)

I. Introduction

When considering the question of certification in cereals, one is apt to compare the very effective and satisfactory certification scheme operating with small seeds (grasses and legumes) with one which might be introduced to cereals. But there are several major differences between cereal seed production and small seed production which have a bearing on this issue.

1. Small seeds are generally more valuable and command higher prices (weight for weight) than cereals. This has a bearing on factors such as costs for labelling and packaging, freight and storage charges etc.
2. Users of small seeds rarely produce their own and purchase their requirements. Hence there is a more stable and regular demand. Cereal growers largely produce their own seed and exchange between neighbouring farmers is common. Hence demand is more irregular. A newly released variety meets a big demand for two or three years, but then demand falls rapidly.
3. With small seeds there is a less frequent release of new cultivars in any one species and a less rapid change-over from one cultivar to another. In cereals there are releases of new cultivars, especially in wheat, and a fairly rapid turn-over of varieties. Records indicate that most varieties rise to a peak of production in 3 or 4 years and are then often replaced fairly quickly.
4. With small seeds there is now an established export demand and standards must be maintained to retain existing customers and attract new ones. With cereals there is no established export market. There would appear to be some potential but demand is likely to be irregular and unpredictable. Many potential markets are difficult politically and for other reasons and the standard of seed quality required varies from country to country.

II. The Export Situation with Cereal Seed

A closer examination of the export situation is justified, as it also has a bearing on the desirability of certifying cereal seed.

1. There are limited wheat growing regions of the world to which Australian varieties are adapted - the Mediterranean countries and the Middle East being the main ones. But even in these countries there are no organized attempts to test Australian varieties against local ones in an effort to promote and create demand for the Australian cultivars.

2. Cereal multiplication is relatively simple and local seed multiplication of imported Australian cultivars in any of these countries could soon affect demand from Australia. Demand is therefore likely to fluctuate which will create problems of over supply, storage etc.

Given a good and regular demand for cereal seed overseas, there would seem to be good reasons for certification to meet required standards and create confidence in importing countries. But cost is still an important consideration as the overseas markets are competitive and the ruling price is an important factor in making sales. Estimates vary as to the extra price certified seed will command to cover costs and it would seem to depend largely on the extent of the procedures adopted for a certification scheme (see later).

III. The Local Situation

This can best be assessed by looking critically at the existing scheme with wheat and barley - is it meeting current requirements and can it cope with future needs? The scheme would appear to be inadequate in its present form.

1. The chief areas of complaint which certification would clearly rectify are:-
 - Purity - instances have been cited of impurities and weeds seeds being present in seed sold under the present scheme.
 - Inadequate identification - insufficient branding and labelling of bags has caused problems.
2. Further areas of complaint which will not necessarily be solved by certification are:-
 - Price variations. This will be solved only by more orderly marketing and an agreement between registered growers.
 - Better Publicity and descriptions of seed being offered for sale.
 - A big inflow of seed from interstate together with the associated hazards of weed introduction etc. Certification could aggravate this situation if interstate seed is cheaper. The latter is caused by the release of varieties interstate and their recommendation before adequate seed supplies have been multiplied locally. Steps are being taken to rectify this situation.
3. There have been relatively few complaints involving genetic or varietal purity and seed-borne diseases. It must therefore be assumed that the present scheme has adequately taken care of these two aspects.

4. It would seem that the demands of importers for small parcels of "pedigree" seed have been satisfactorily met so far by registered growers. General specifications for such seed are 98% purity, 85% germination and a good appearance. The ability to meet much larger orders for cheaper seed of a lower standard has been more difficult, and it is doubtful whether certification will solve this problem.

IV. Cereal Certification

Mr. D. Ragless in presenting the case "FOR" certification has given a comprehensive outline of the procedures which might be adopted in implementing a certification scheme. It is appreciated that not all of these procedures need be carried out and in some instances two or three can be covered in the one inspection or operation.

V. Possible problem areas of cereal certification

1. Certified seed implies good quality seed. Standards will have to be met. There is extra work involved which will mean added costs to the consumer. This may not be great - estimates vary from \$3.00 per tonne (8¢/bus) or two or three times that amount. Will growers be willing to pay more? The quality conscious will, although they may renew their seed less frequently.
2. Certification will reduce the flexibility of the present scheme. This has particular significance in the rapid change-over from one variety to another.
3. Growers of certified seed are more likely to face the risk of having a crop rejected than under the present scheme.
4. Irregular demand has resulted in registered growers being left with unsold seed in some seasons. This problem won't diminish with higher priced certified seed.
5. Varietal or genetic purity is difficult to establish with some varieties e.g. Timgalen and Condor. This problem could intensify with the further release of varieties with semidwarf parentage.

It is significant that no other Australian mainland State certifies cereal seed, and Tasmania, which had a certified scheme for cereals has now relaxed inspections so that it can no longer be called a certified scheme.

VI. Upgrading the present scheme without Certification

It is suggested that the existing scheme for wheat and barley might be continued with the following improvements:-

1. Analysis for purity and viability

Samples to be collected (possibly from the header and again after processing), analysed for purity, tested

for viability and certificates issued to the grower with the results of these tests.

These certificates to be available to any prospective buyer for his information and protection.

2. Inspection Report

Officers inspecting crops prior to harvest to issue a detailed inspection report on genetic purity, presence of weeds, diseases etc., These reports likewise are to be available to prospective buyers. (Copies of both of the above to be sent to the office of the District Agronomist in the area and be available for inspection by prospective buyers.)

3. All seed offered for sale to be adequately labelled or branded.
4. Greater promotion of the value of using high quality seed to be undertaken. Seed supplies available to be freely publicised.

The cost of these extra services will be minimal and should add only marginally to the price of seed now provided by registered growers.

The above is designed to get greater acceptance of recommended varieties by growers and also encourage the regular renewal of seed by the commercial grower by having available adequate supplies of good quality moderately priced seed.

South Australia's present scheme for wheat and barley is already equal to those of any other mainland State and the proposed improvements will make it superior to any.

4.3 DISCUSSION ON CEREAL SEED PRODUCTION

Many growers expressed concern about the situation that had occurred with the early release of Condor and Kite in N.S.W. Seed supplies were not available locally and considerable quantities were imported.

The meeting was assured that this was an unusual case brought about by two consecutive seasons in which rust was a problem and possibly some lack of liaison between States. This was being remedied.

As far as other new varieties are concerned, it was suggested that seed from varieties under test in advanced trials should be built up during the final testing period so that seed supplies were available locally when such varieties are released.

Growers were told not to expect a large regular export market for cereal seed as is the case with pasture seeds. It was considered that overseas importing countries may buy small quantities of new varieties but would then multiply their own seed requirements rather than import large quantities each year because of costs, particularly freight rates.

There was general agreement that cereal seed should be sold in labelled bags giving details of variety, weight, bunticide used, grower's name (or number) etc. This branding would help buyers and would enable accurate identification and a trace back of seed if necessary.

General agreement was also reached concerning purity testing. It was felt that this is a necessary part of any seed scheme. A grower expressed the opinion that seed should be sampled and tested before processing and treatment so that poor quality seed could be sold as commercial grain through the normal marketing boards.

Another view expressed was that seed should be sampled and tested after processing. If both of the proposals were to be implemented there could be some increase in costs because of the two samplings. At present cereal seed is not tested.

The meeting also agreed that crops should be inspected at least once (just prior to harvest) by an officer of the Department of Agriculture and that a report of this inspection should be issued to the grower and be available for inspection by prospective buyers. In this way a buyer is given information on the crop from which the seed came.

At present there is no set minimum standard which crops need to meet in order to pass inspection. The standard is the judgement of the inspecting officer as to the suitability of the crop for seed production.

A registered grower suggested that there are two types of seed buyers - some will buy 2 or 3 bags, demand high quality, and build up their own seed supplies from this. Others will want large quantities to sow a whole paddock or more and are less concerned about quality.

It was therefore suggested that a 2-tiered system was really needed - a certified system to meet smaller orders for high quality seed, and a somewhat lower quality system similar to the present scheme to meet larger orders.

Therefore the smaller seed lots will need a higher standard of quality. He believed that stockpiling problems would occur if all seed were to be certified.

There was general agreement that some certification system should be considered for the future. However, opinions differed as to the added costs involved in the implementation of a certification scheme for cereals and the increased cost of such seed to buyers - estimates varied from 8-30%. This would be governed somewhat by the degree of sophistication agreed to for such a scheme and the standards required.

The proposed oat certification scheme was outlined. It was proposed that this should apply only to recommended varieties. Up to 1500 hectares could be inspected and handled by existing staff. Basic seed from Western Australia of the varieties Swan, Avon and West was being multiplied on the Kangaroo Island Research Centre this season. Kangaroo Island was chosen because it is relatively free of wild oats.

5.1 WHY WE NEED CERTIFICATION IN OILSEED SEEDS

J.K. Anderson
 Chairman, Oil and Protein Crops
 Committee,
 United Farmers and Graziers of
 S.A. Incorporated.

A. The Oilseed industry and its place in the national economy

1. We have a very small oilseed industry by world standards, both in relation to our other agriculture and our national economy.
2. It is vital to our national well-being that it expand, as it can supply improved products to enhance our living standards and ease problems such as pollution.
 - (a) poly unsaturated food oils
 - (b) poly meat and milk products
 - (c) polli oils for pastics
 - (d) raw materials for truely bio degradable detergents now compulsory in some European countries.
 - (e) high quality lubricants and hydraulic oils
 - (f) the castor group, still the best lubricants, also feed stock for synthetic fibres.
 - (g) general industrial uses - paints etc.
 - (h) specialist requirements - steel manufacture, mineral flotation.
3. We are very deficient in oils for some of these uses and only have a regular surplus of linseed oil.
4. Many of the before mentioned processes cannot be developed without a large increase in production of rapeseed and sunflower, although safflower could be in increased demand. It is a difficult crop, both from the point of the grower and the researcher, thus it is unlikely to be developed much more at present.

In order to see the establishment of a polli oils plant, we would need to produce at least quarter of a million tons of rapeseed and possibly, double that much.

B. The problem areas of the Australian Oilseed industry

1. Protein meals are difficult to quit on our local market. High freight rates give crushers poor margins on export sales of meal.
2. Lack of stability in supply of crushing seed, due mainly to poor adaption of varieties in our conditions, and consequent mistrust of growers. Oilseeds tend to be desperation crops, with very few growers prepared to learn the techniques necessary to produce them. Poor seed and weedy seed is also a factor in this lack of interest.

3. Imports of palm oil are reducing the competitive position of local crushers and making exports necessary.

C. Why seed certification?

1. Currently, seed varieties are very mixed, resulting in uneven maturity of crops, disease susceptible types are mixed in with resistant species - for example, Glenelg linseed developed for Pasmu resistance now contains many blue flowered varieties, and also some white flowered ones.

Existing rapeseed varieties are mixed with both early and late types together, plus in some cases, a few sterile hybrids. There is no guarantee that blackleg spores are not present in the sample.

Likewise, linseed seed sold last year introduced Pasmu to many clean properties.

In the not too distant future, rapeseed will have to be segregated into L.E.A.R. and H.E.A.R. varieties, due to requirements for low euricic acid contents in food oils. Yet industrial users will require euricic acid oils. Without certification, we would have to ban the production of H.E.A.R. types, as it is unlikely strains could be kept true. Any seed exporters will require pure seed of each type, with tolerance of no more than 4-5p.c. euricic acid in L.E.A.R. seed.

Sunflowers are also mixed with some birdseed in many samples. This lowers the oil content, thus affecting the growers return. Because of a mixture of oil varieties, maturity of the crop can be very uneven.

Weed seeds also get through. A small selection I remember is from Kangaroo Island in about 1970/71. Dock, jointed charlock, wild turnip and wild radish all turned up in rapeseed grown on previously clean country. This particular seed came from one of our crushers.

Linseed last year contained traces of rapeseed in some instances. Hardly satisfactory to the crusher either as this mixes a drying oil with a non-drying oil. However in most cases, the grower is the main loser. For example, poor yielding varieties of linseed mixed in with Glenelg, also they mature much later, thus causing difficulties at harvest time, due to moisture content.

Campestris rapeseed ripens a month earlier than Napus - do you wait until it is all ripe and lose the early lot with wind or ignore the green plants and take a price penalty for high moisture content? Price dockages offered against moisture content last season went as high as \$85 per tonne, and uneven maturity was the main cause of that grower's problem.

We have an industry which badly needs a boost of confidence but unless some of these factors are overcome, it is difficult to see it coming.

Crushers set and enforce the receival standards with price bonification and dockage points, then they very often supply seed which is likely to make the achievement of those standards difficult.

I view seed certification as an urgent requirement in the oilseed industry.

5.2 SEED PRODUCTION IN OTHER FIELD CROPS - PRESENT STANDARDS AND FUTURE NEEDS

P.J. Mowatt
District Agronomist, Struan

Which "Other" Field Crops

My remarks are based on two groups of crops, being the oil seed crops (e.g. Oil seed rape, linseed, sunflower and safflower) and the grain legume crops (e.g. field peas, lupins, lentils, tick beans).

What are the Present Standards?

Our experience is mainly with field peas, as the other crops are relatively new to South Australia. However, all except peas are subject to formal standards laid down in the Agricultural Seeds Act and the Weeds Act. Peas are subject to the Weeds Act, but exempt from the Seeds Act at present. Despite this, the field standards of peas seem quite good, possibly because the field pea industry has a registered seed growers scheme, similar to the cereal scheme. Thus high quality seed is produced at Turretfield Research Centre, before being multiplied up and distributed by registered growers.

No similar scheme operates for the other crops, and seed is currently being bought in from interstate. However, seed crops of lupins and oil seed rape may be produced in S.A. this year.

The general field standard of these crops has been fair, with some notable exceptions showing up as contamination with purity, weeds and disease.

What are the Future Needs?

I wish to discuss two issues on standards - that of review and agreement. I am concerned not so much with the actual standard, but more for the need of them.

(a) Review of Standards

I refer to the formal standards set out in the Agricultural Seeds Act.

Purity - This will become more difficult with the introduction of cross pollinated crops e.g.: lupins, oil seed rape and sunflowers. Cross pollination can be between cultivars of between desirable and less desirable plants of the same species (e.g. oil seed rape and turnip). Therefore, isolation becomes an important factor. We must know the ease and degree of crossing that may take place.

With few exceptions, people think of high level of purity, thus it is the mechanics of maintaining this high level in field crops that needs consideration.

Germination ability - with these new crops, farmers are tending to purchase annually their total crop seed requirements. This means seed for large areas, involving large cash outlay, and they expect high germination ability. Many crop standards are currently set at around 65% germination, which I consider too low if the present trend is to be encouraged. Germination of at least 75% should be the minimum, particularly when few seed samples fall below this figure.

Weed Contamination - again, limits are set under the Seeds, and the Weeds Act. However, there is a need to ensure that the buyer is aware of the limits, and of the content within them, e.g. 0.2% by weight weed seed impurities are allowed in lupin seed, and just what weed seeds are in that sample for sale.

Easier accessibility to that information, such as labelling, is one aspect, but farmer education on the need to seek such details before purchase is equally important.

Disease contamination - this is an area of particular concern. We seem to be introducing crops that are comparatively more susceptible to a range of seed borne diseases, and we are growing these crops in areas where climatic conditions frequently favour disease development.

Even within the small, allowable limits of impurities, there can be diseased seed, diseased debris, or disease particles. And small amounts multiply rapidly in favourable conditions.

An example of this is lupins. Since 1972, we have "imported" many seed borne diseases for this crop. To highlight this, Dr. A. Dube showed some slides of the range and severity of damage to lupins.

To support those slides, I suggest that every lupin crop in the South East this season has some degree of disease from seed borne infection. Not only does this create management problems, but it also places the future of lupins as a viable crop under doubt, which is a sorry indictment of our interest in a new industry. Lupin is an example, as this disease effect could be similar on other crops.

Detection of seed borne disease is difficult, and may be impossible in seed samples. But more effort is needed in this direction, even if it only means delaying the inevitable. There is little profit in most sections of farming today, hence I urge all that are involved in seed handling to give more thought to the principle of quality, and not just to the legal requirements of trading.

(b) Agreement on Standards

Here, I would like you to think not only of the just mentioned standards, but others which are also important to various sections of an industry e.g. seed size, regularity of size and weight etc).

With the crops under discussion, there is a good opportunity for close working relationship between grower, trader/seed supplier, and processor/consumer. Such an arrangement would see develop both a better understanding of what and why seed quality is about, and a stronger commitment from the whole industry to maintain a quality level.

Within the industry, there is a lot of seed moved around the State and between States. This is good business for the whole industry, but if the people involved in this seed movement (whether individuals, farmer organisations or companies) have been instrumental in the setting of standards, then there is every chance that they will strive to excell them.

This conference is a start to such a relationship, but I would see it as the forerunner to more, which should include better grower and industry representation.

One other necessary level of agreement is between States. There is communication between them, and some progress is being made. This progress must continue strongly as these crops will continue to be grown in several States, yet at such small production quantities as to require seed movement between states. Agreement may require some give and take from all concerned to develop standards that are nationally acceptable.

(c) Annual seed requirements

Another point to keep in mind is the production area and crop type involved, and here I refer to Fig. 1.

Fig. 1: Area sown and seed area requirements of crops other than cereals

	Area of crop (hectares)	Area of seed (hectares)
Field peas	12000	400
Lupins	10000	400
Oilseed rape	5000	12
Linseed	3000	70
Safflower	2000	20
Sunflower	6000	15

With the exception of peas and lupins, the others need only small quantities of seed for total yearly sowings. And farmers are likely to carry over seed of peas and lupins in a similar manner to cereals, thus their seed production needs will also be about 15-20% of what is shown on the chart.

Another factor is the more frequent introduction of cross pollinated crops. There is more likelihood of rapid on-farm purity decline, and the need for farmers to purchase seed more frequently - possibly yearly.

Similarly, hybrid cultivars are being developed for some of these crops, and those will force the farmer to obtain quality seed yearly.

Thus, keeping in mind my previous comments, I suggest that two further issues need consideration. Firstly, that seed production be encouraged by the minimum possible numbers of growers (individuals, organisations or companies). Quality control during production and quality checking will become harder in future, and without wishing to create monopolies, fewer producers are likely to develop specialisation and high standards. Secondly, the number of cultivars of any one crop be minimised. This is a current trend but takes on greater significance when we start growing cross pollinated crops.

(d) Why this Conference?

To all of us, seed quality is probably a clear need, and our discussions have been valuable in re-assessing this need. But what of the people who decide the year to year field standard of these crops - the farmers. I'm sure they appreciate quality in principle. But very questionably in their actions. It is nebulous, confusing, emotional, and with few realistic suggestions.

Seed quality is an issue that needs some farm based guidelines, some strong industry encouragement, but not the "stick" of legislation. So, these discussions are very much unfinished, unless we do more than talk here.

5.3 SEED PRODUCTION IN OTHER FIELD CROPS -- PRESENT STANDARDS
AND FUTURE NEEDS AS SEEN BY THE SEED INDUSTRY

R.J. Russ,
Manager, Wright Stephenson & Co.
(Aust.) Pty. Ltd.
Naracoorte.

I notice that I am listed to speak on behalf of the Seed Industry, but as you have heard Mr. J.K. Anderson speak on aspects of the Industry from a grower/consumer point of view and Mr. P.J. Mowatt as an agronomist I will confine my comments to Present Problems, Future Needs from the viewpoint of the processor/marketing section of the Industry.

The Australian agricultural Seed Industry is valued at some \$12,000,000 annually. It is small by comparison with many other primary industries, but is of sufficient size and importance to warrant at least some investigation, if only to document the past and existing situation. The fact that there have been no such studies, or at least none published, is due perhaps to the seed being sold mainly on an internal market. The Industry is not an earner of foreign exchange of any consequence and hence, does not rate highly as a subject of study with many economists. It is true also that governmental research and regulatory personnel associated with the Industry have shown little interest in aspects other than those with a technical or scientific basis.

In terms of total production, and species and cultivar diversity, the Australian Seed Industry has shown a fairly rapid expansion, but this same expansion is not necessarily evident in terms of crop value. The most immediately apparent features of the Australian Seed Industry are the extreme diversity of species and cultivars and the increasing trend towards regional specialization. It is an Industry which has shown an increase up to 1975 more in volume production than value, while at the present time it is, along with many other Agricultural Industries almost certainly either static or declining, both in terms of volume production and actual value.

For most Australian agricultural products, the eventual user or consumer of the product is separated from the producer by both distance and occupation and this had led to the product reaching the consumer in most instances through Merchants or Brokers, or at times through statutory or voluntary boards or grower controlled pools. With agricultural seeds, the consumers are not always separated from the producers and this has resulted in a more complex overall marketing situation.

Lack of liaison between sections of the Industry due to paranoia by some and apathy by others had done little to bridge the gulf of misunderstanding that continues to plague our Industry. The need for Merchants to understand the aspirations and requirements of growers and visa versa can be balanced by an even handed and objective attitude by State Departments of Agriculture.

You will have to admit it is often difficult to find out the latest information on new varieties or new aspects of existing popular varieties as much of the recent results of State and Commonwealth Government Research Departments are either tucked away in an office filing cabinet or buried under a mountain of scientific jargon in some obscure research journal.

What is needed is a basic involvement of grower, marketer and extension worker, not only on a day to day cultural basis but an involvement in basic strategies that affect this Industry. The Department of Agriculture in South Australia does play a strong role in the area of extension and consumer education but some other States do not. The Seed Industry Association of Australia (S.I.A.) also is involved, but both the Government and S.I.A. could increase their tempo in this area. I see this conference as a step in the right direction and welcome it.

The need of the Industry to realize now, or in the near future, the difference between seed produced for commercial multiplication as distinct from seed produced for processing is very real. I suspect that many of you are already thinking as I am, that the ad hoc and sideline approach to cereal and other minor crop production for resowing will have to be divorced from the present idea, that being, that each farmer retains his own seed for sowing from the preceding harvest.

Some means of providing maintenance of varietal purity of seed grains, oilseeds and other grain legume crops is vital to the future of the Industry. It staggers me to see many growers and sowers of seed uninterested in the source of the material they plant their hope on. These same people would concede the need to pay top money for a livestock sire of reputable background and the idea of using beasts of unproven performance or genetic defect is unthinkable - the difference escapes me!

Consideration should be given to the expansion of the existing certification and approved seed schemes to bring many of the newer and important varieties under the general supervision of the Department of Agriculture. The Department could consider the possibility of allowing the private sector to carry out some of this work.

It is interesting to note that new legislation in the U.K. requires all new sowings of crop and cereal seed to be of a certified or approved standard.

The release of new cultivars without the withdrawal of the old cultivar that it is intended to replace is an area that needs consideration. Examination of the long list of pasture seed cultivars released in the last five years and a compilation of those still in general use for the purpose they were intended would give rise to a scandalous situation from which few of us in the Industry could escape responsibility.

Plant Breeders rights are essential for the development of the seed and grain Industry for the protection and encouragement they will provide to those people and or organizations who become involved in production and introduction of new and improved varieties. Our creditability with overseas plant breeders is at stake and must be protected.

Present quality control systems vary from State to State. It is interesting to note that the New Victorian Seeds Act and Regulations have not caused the dislocation predicted to marketing, more so, it has tended to strengthen the forces of responsible marketing.

Mr. R.R. Heading, Senior Seeds Officer, Victorian Department of Agriculture who recently attended an O.E.C.D. meeting in Paris as the Australian representative has stated on his return when discussing seed legislation, "that there was now a definite tendency to use the minimum standard system rather than the truth in labelling system", at the same time he stated, "There is a definite need for some changes to be made to the Australian current minimum standard system which he considered to be unnecessarily rigid and restrictive.

There is no doubt that the introduction of the Truth in Labelling system in South Australia has attempted to dispel many of the misconceptions commonly held about seed quality, and any action that will remove confusion is a good one, but it does seem odd that legislation in the pipeline for so long, as in the case with the intended New Seeds Act here in South Australia, may be outdated before it sees the light of day.

In the processing sphere the main problem is that of over capacity. A system of registration is needed and within this framework, consideration to the restriction of granting licences is needed. As the proliferation of processing plants continues the already excess capacity is forced to expand still further in an industry where 90% of processing plants in South Australia operate at full capacity only four months in twelve. The obvious consequence is higher cost to seed producers as processors strive to recover labour and maintenance costs from a reduced share of a not expanding market. You may ask, "Is it not true that high seed grading and handling costs are forcing growers into setting up their own plants?" and I would answer that South Australian costs to growers are the lowest in Australia and are 20% below the next nearest interstate charges.

There is a great variation in seed grading charges within this State and it may shock you to learn that while there are many processors who do, there are many processors who do not observe the rates of pay and conditions set down in awards. When this situation is attended to it will be understood how such variation in processing charges has been possible.

What should be occurring, is that the processing industry that exists should be upgrading and expanding in an effort to give growers cost savings and at the same time give a reasonable return on capital invested. Until rationalization occurs there will be little relief in charges to growers and precious little return on capital invested in this section of the industry.

There will be overall agreement that the past and present trend in the Australian seed industry towards regional specialization and producer efficiency brought about by highly competitive marketing conditions, is a desirable one. At the same time, there should also be agreement that the frequent extreme lack of price stability intrinsic in such a system, is not particularly desirable for producers, merchants, or consumers. To encourage the desirable and reduce the undesirable attributes of Australian seed production and marketing, is now, and will not be in the future, by any means a simple matter. With some other agricultural industries, producers in each State can and do, to a large extent, go their own separate ways. Although this causes unfortunate results at times, frequently the marketing situation is such that there is only limited interdependence. Australian seed producers however, are to a large extent all in together, whether they like it or not. Seeds are a high value commodity and Section 92 of the Constitution and the ever improving internal transport system will continue to ensure that the activities of producers in one State have a direct influence on producers in other States.

The responsibilities of State Departments of Agriculture and other bodies such as S.I.A. regards advice to producers and others on marketing questions, are up to date not clearly defined. In some States, attempts are made by Departments of Agriculture to advise producers on carry-over stocks, likely future demand, and various other aspects of marketing. In other States, there appears little governmental or organizational activity in this direction. If information on marketing questions is not available to producers or consumers it is probable that they are placed in a worse bargaining position than merchants when arranging sales. The latter at least, normally have district agents and contacts in other States from whom information is available on seasonal conditions, carry-over stocks, and seasonal production statistics. S.I.A. through its trading section is consistently attempting to collate information on carry-over stocks, likely future trends and the direction it considers the industry should be taking. All this information is readily available but I suspect is seldom called for.

The future may see a more conscious attempt on the part of the Industry to keep producers and consumers informed on marketing questions. To achieve this, close co-operation will be necessary between Government departments, and other sections of the industry. Only with such co-operation, will it be possible to produce worthwhile statistics and information for distribution. I do not see marketing advice as a role that Departments of Agriculture should undertake. I believe they should be informed on marketing questions but that they should concede that the marketing section of the Industry is responsible and experienced enough to provide the Industry with information on matters they are best qualified to give.

89.

I have been critical and I trust you find these criticisms to be constructive as that is my intention.

5.4 DISCUSSION ON SEED PRODUCTION IN OTHER CROPS

Lupins

Two lupin crops in the South East were being grown this year, using certified seed from Western Australia, with the intention of possible release of certified lupin seed in South Australia next year. The major problem likely to be encountered was disease identification incidence in the crops and the lack of standards by which these diseases could be measured. Without these standards seed could not be certified. The need for clean seed was highlighted by the fact that pea weevil has spread to the South East in field peas that were contaminants of lupin seed imported from Western Australia. These weevils could have a great effect on the canning pea industry in the South East because, unlike splitting peas, where small amounts of weevil damage are acceptable, any weevil attack on peas for canning will affect their appearance and possibly make them unfit for use. There now seems to be no chance of limiting the spread of pea weevil throughout the South East.

For an effective seed certification scheme good foundation seed must be provided. This was done for lupins through the new varieties being bred by Dr. J.S. Gladstones in W.A. but some other alternate crops did not have good foundation seed available to initiate an efficient certification scheme.

Field Peas

Field peas were reasonably well catered for by good seed being released through the Department of Agriculture at Turretfield. However there was a complaint of blue boiler peas from Tasmania introducing pea weevil to the Bordertown area. Pea weevil can, however, be controlled by fumigation so it should not be a problem in pea seed if the correct precautions are taken.

Oilseed Rape and Linseed

The Victorian Department of Agriculture has proposed to grow certified rapeseed and linseed. The S.A. Department of Agriculture has not yet been notified of this scheme.

The most important factor with growing oilseed rape for seed is to sow the crops late in the season to avoid the conditions that favour blackleg infestations.

Another major problem that would affect certification of the rapeseed crops is the mixing of high and low erucic acid types. Some degree of control in this situation was needed. The mixing of types could cause increases of costs to the crushers and the only way of this being resolved was the banning of high erucic acid types. Last year, in Victoria Meggitts had 7 rapeseed crops grown for seed. Only 2 crops were finally accepted as clean seed.

It was felt that if Victoria introduced an effective rapeseed certification scheme most of our seed needs would be supplied from that service, as S.A. uses only about 20 tonnes of rapeseed per year for sowing at present.

Generally linseed was discounted as a crop as the meeting felt it was of diminishing importance and also most seed is produced by the farmers. A top quality line would be needed for a certification scheme and the current variety, Glenelg, seems to be too variable to be used.

Sunflower

In general there was little discussion of sunflowers as a seed crop. Most sunflower seed is from Qld. and N.S.W. because the oilseed part of the seeds industry was not ready for the large increases in sunflower production in Southern Australia. Open pollinated varieties show very great variation in height, maturity etc., and it would be difficult to produce certified seed. Only two hybrids are at present grown and these are produced by commercial companies.

Role of the Department of Agriculture

The meeting was not able to fully agree on the role of the Department of Agriculture in seed production of other crops.

It was stated that Meggitt Ltd. will only give contracts to growers who sow new seed each year. This was done to ensure that good seed was provided each year.

United Farmers and Graziers would like to see some system of approved seed at the grower level.

With interstate trading of seed it was felt that most of the seed from crops certified in other states (e.g. rapeseed in Victoria) would be supplied from these states. Our grain legume and oilseed industries are so small that some felt that most of our seed would come from interstate and that the role of the Department of Agriculture should be to administer and monitor the standards necessary for effective certification of seed. Commercial companies would have more resources for production and transport of seed than would the Department of Agriculture.

A grower felt that the Department should produce a bulletin to explain to farmers the problems associated with outcrossing crops. Another grower asked whether the Department was working on any new crops especially bean crops. He was told that the Waite Institute was doing this at the moment.

In general it was agreed that greater liaison between Departments of Agriculture on a national basis and between departments, growers and industry on a State basis would be very desirable.

Most people agreed that better seed from some sort of controlled seed production scheme would be very desirable for the grain legume and oilseed industries. However no real conclusions about how this was to be done were reached.