



DEPARTMENT OF AGRICULTURE, SOUTH AUSTRALIA

## Agronomy Branch Report

INTERSTATE STUDY TOUR REPORT ON PASTURE SEED

PRODUCTION & CERTIFICATION

2nd to 15th November, 1974

W.O. Coleman, G.E. Cooper, I.H. Simons, C.A. Schubert  
Seed Production Advisers

Report compiled by: W.O. Coleman

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# INTERSTATE STUDY TOUR REPORT ON PASTURE SEED

## PRODUCTION & CERTIFICATION

### 1. INTRODUCTION:

The objective of the tour was to enable four seed production advisers to study and discuss the latest developments in pasture seed production and certification with the Departments of Agriculture in New South Wales and Victoria, and with C.S.I.R.O., Canberra.

Planning included visits to the following:-

- \* Seed production officers and research workers
- \* Selected seed growers
- \* Seed processors
- \* Seed research institutions
- \* Seed laboratories

The tour commenced with discussions with Departmental officers at Wagga and an inspection of the Temora Agricultural Research Station. From there, after visiting more crops in the Cowra district, the party went on to Sydney and Canberra before moving into Victoria. Here we inspected cleaning sheds and seed crops at Benalla and Mansfield, the seed laboratory in Melbourne, a cleaning shed at Winchelsea, and finally completing the tour by visiting a cleaning shed and inspecting a crop at Ballarat.

### 2. SEED CROP PROBLEMS:

#### 2.1 Contamination of Sub. Clover Seed.

General certification problems were discussed with seed certification officers at Wagga, N.S.W., and it was interesting to hear of similar problems to our own. One was the increasing contamination of sub. clover seed crops by other cultivars.

Paddock inspections of two Woogenellup seed crops which were rejected some years previously because of contamination by Dwalganup sub. now revealed only a trace. This had been achieved by harvesting an uncertified seed crop to clean up as much seed as possible. Then a two or three year cropping programme followed. The last crop was sown under at 10 kg per ha of good genetic quality Woogenellup seed. The yield was estimated at 500 to 600 kg per ha.

We were impressed with the care taken to produce true-to-type clover crops, and believe some of our South Australian growers could very well take heed of the trouble some N.S.W. and Victorian growers were taking.

In northern Victoria, Mr. Gordon Hendy of Hendy Bros., was producing Bacchus Marsh sub. on one property and Woogenellup on another. They firstly cleaned the land using a cropping programme which produced up to three crops in 14 months - clover hay, sunflowers and then barley! Clover for seed was established under a wheat crop, using mother seed of the same cultivar at a heavy seed-rate up to 16 to 18 kg per ha. This rate did not appear to reduce cereal yields. Their seed crops were irrigated.

These farmers do not move sheep from a Woogenellup area straight to a Bacchus Marsh seed paddock or vice versa, without first holding them in a suitable area for several days to avoid contamination. Machinery is always well cleaned before moving or being used again on a different variety. Likewise, in their cleaning shed a good clean down is always carried out.

## 2.2 Availability of Mother Seed

More than once on the tour the problem of shortage of mother seed was discussed. An opinion was given that it is the industry's responsibility.

## 2.3 Basic Seed

In the sowing down of perennials for seed production, it was agreed basic seed should always be used in preference to first generation. This has at least three advantages:-

- \* Higher class seed being produced
- \* Easier to come within the O.E.C.D. range
- \* Encouragement to produce basic seed.

## 2.4 New Seeding Equipment

At the C.S.I.R.O. Ginnindara Experimental Farm near Canberra we saw a demonstration of the "Siro-seeder" - a sod seeder featuring special tillage and seeding equipment. It is designed for establishing a pasture with minimum tillage. It has an opening disc followed by a terra-foil coulter, cutting to a depth of 12 cm. This in turn is followed by a rubber covered press wheel that lightly closes the opening. The narrow seeding boot then places the seed at the desired depth (5 cm) and light springs on either side of the narrow furrow cover the seed. The results to this stage look encouraging.

## 2.5 Weed Control

Noxious weeds are not considered a problem by the N.S.W. officers if they can be easily cleaned out of the seed. Skeleton weed has been controlled by 0.7 litres of amine 2,4-D per ha plus a good clean pasture to give it competition. In white clover this weed is ignored because the crop will be harvested before the weed sets seed!

In clover paddocks, wild oats are controlled by Neoban(R).

In perennial grass seed crops, docks are sprayed either with 1.5 litres per ha of dicamba (Banex(R)) costing \$8-10 per ha or 0.35 litres per ha of Tordon(R) and amine 2,4-D. Another grower used Vorox(R) for spot spraying dock plus a dye as a marker and usually has three men operating spray nozzles attached by long hoses to a spray unit pump.

For general weed control in perennials, diuron or atrazine is used.

A new desiccant herbicide, glyphosate (Roundup(R)), a Monsanto product marketed by I.C.I.-Geigy (Aust.) Pty. Ltd., is claimed to give better results than Spray-seed(R). A dose rate of 300 g per ha has given good results. It has a great potential if available and at a competitive price. C.S.I.R.O. at Canberra have been testing this chemical.

It was encouraging to note that both states visited were using our weed control charts for their recommendations.

## 2.6 Fertilisers

On grass seed crops, nitrogen is applied at rates similar to those used in South Australia. One grower uses 80 kg per ha applied in split dressings in the spring.

## 2.7 Diseases

### 2.7.1 Kabatiella - clover scorch

Mr. Roger Southwood, a Research Officer (Pastures) at Temora, N.S.W., was screening sub. clover cultivars for Kabatiella resistance and low oestrogen content. Twenty-six sub. clover varieties were being evaluated including the testing of "brachycalycinum" species. At present Daliak seems to be useful in this field, but tends to become grassy with the clover "going out". Most resistant varieties are too late to be of much use. There is a need for a clover for the 375 to 450 mm rainfall areas.

A pathologist in Melbourne, Dr. Tony Kellock, had a story to tell in controlling Kabatiella. The first signs of the disease is a dewy effect showing up in small patches. He stated seed-borne infection was very doubtful, the spores do not look tough enough! He has been experimenting by spraying clover with Benlate(R) at from 0.3 to 1 kg per ha. Benlate(R) costs about \$24 per kg and is obtainable from Du Pont (Aust.) Ltd.

The recommendation would be to graze subterranean clover to the end of September, then spray using 400 g per ha in 100 litres of water per hectare. The cost is about \$15 per hectare. Benlate(R) is also an insecticide and controls red legged earth mites.

Larissa sub. clover may be a replacement for Yarloop, being lower in oestrogen and could be resistant to Kabatiella.

At the Werribee Research Station we inspected some successful trials with Benlate(R) on this disease, even down to 280 g per ha.

### 2.7.2 Clover root rot

Dr. Kellock is also investigating Fusarium avenaceum, clover root rot. It affects the tap root of plants and is a fungus, affecting up to 30 per cent of the seed. It is doubtful if it is soil-borne, but more likely debris-borne. This can be controlled by using 1 g Benlate(R) to 1 kg of seed.

Another disease, clover red virus, was mentioned. Whole paddocks turn red.

### 2.7.3 Bacterial wilt

Dr. Satich W. Lamajeemah, also a pathologist of the Victorian Department of Agriculture and a quarantine officer on diseases, talked to us of the problem of bacterial wilt in Victoria. His talk was illustrated with coloured slides. The disease spreads

very easily but not quickly. All machinery used in an infected area should be disinfected. The cutting, baling and cartage of lucerne fodder by contractors has been the problem in the spread of the disease. Affected lucerne stands last only three or four years, are ploughed out and resown, probably lasting another three years.

We were told, when sending samples for identification, it was essential they be packed in ice or refrigerated for transport. General opinion is that the disease is not seed-borne.

Control is by resistant varieties on which the Victorian Department is currently working. One of these, Thor, is now being grown by Wright Stephenson Ltd. for the U.S.A. There is a potential of 10,000 tonnes for this market!

## 2.8 Irrigation - Control of Water Flow

A type of sluice gate used by Mr. John Farley along his flood irrigation channel was an improvement. He was irrigating Haifa white clover from the Lachlan River by a 900 kilolitres an hour pump. Made of cement, the actual sluice gate was a half circle with the rounded part being the sides and bottom. This enabled the gate to be set at any angle to allow out the required amount of water. The rounded side of the sluice gate fitted neatly into a ledge of the cement outlet. In other respects the layout was similar to what we see in Keppoch and Padthaway.

## 2.9 Windrowing

Most grass seed crops are windrowed, particularly on the large properties where it would not be possible to direct head all the crop at the optimum time. Mr. Ross Sutherland of "Seaton Vale" near Yarck, Victoria, who harvests 600 ha of such crops, uses John Deere windrowers. Fitted to these machines is a pipe frame out in front which pushes the crop forward before it is cut; the cut crop goes up over the canvas butts first! To fit this frame, it is attached to the divider ends and is adjusted for height and extends with two bars about 1.2 metres in front of the knife. It was claimed this method made a tighter and neater windrow.

The comment was made that a windrowed Currie cocksfoot crop was easier to harvest after a thunderstorm. The Sutherlands use two John Deere headers with Draper pick-up attachments.

Demeter fescue seed costs 10 cents per kg to clean.

## 2.10 Seed Retention of Phalaris

Both Mr. A. Schroeder of C.S.I.R.O., Canberra and Mrs. Joan Mullet, a Senior Seeds Research Officer of the Victorian Department, spoke of a material, AF 1510, an ingredient of latex paint from Monsanto (Aust.) Ltd., which was effectively reducing phalaris seed shattering. This was applied at 1:50 ratio, i.e. 550 ml in 225 litres of water per ha.



It is best applied in dull weather with a boom, and must be put on a few days before seed starts to shed. Boom jets are fitted closely together at different angles (~~at different angles~~) to get the spray into the heads. This was obtained by pushing the crop down to a height of about 50 cm. A pipe frame was used attached in front of the boom. The boom used covered 12 metres and the cost of material was about \$50-70 per ha. The experimental work is still continuing.

A crop of Sirocco phalaris growing on the rich Lachlan River flats gave an average yield of 200 kg per ha after spraying with the above material. Extra cost was \$50 per ha.

### 2.11 Harvesting Phalaris

This problem came up several times in discussions. Best yields were up to 300 kg per ha for Australian. This was obtained with a binder and stooking. Another method we were told for Australian and Seedmaster varieties was by double harvesting. The first time leave the stubble about 15 cm high to hold the tailings. The seed would need drying. After leaving a few days the tailings would be re-thrashed and the two lots of seed blended together.

In Victoria most phalaris crops are windrowed before harvesting.

### 2.12 Harvesting of White Clover

Mr. M. Church of C.A. Church & Sons, near Numurkah, northern Victoria, has a home-made pick-up front on his header for harvesting irrigated white clover seed. The crop is first windrowed with two swath boards attached to the mower. The header has road brooms attached, so they revolve picking up the clover vines over the top of the rollers into the open front of the header. We were told it works very well with little or no seed loss.

The white clover we saw was flowering. It had been sown with mother seed at 2-3 kg per ha and 250 kg per ha of super was applied and then the crop irrigated. Bees are important for good pollination. Expected yield is from 170 to 230 kg per ha, and the price \$1.30 to \$1.50 per kg. Retail price is \$2.00 to \$3.00 per kg.

### 2.13 Orbital Grain Cleaner

Whilst in Sydney we were shown a pamphlet on an orbital grain cleaner costing about \$800, which it was thought may interest our seed growers as a pre-cleaning machine. It is produced by Gunnedah Industries, 32 Herbert Street, Gunnedah.

### 2.14 Large Bulk Bins

Mr. Graham Stoney of Mansfield, Victoria, harvests 400 ha of grass seed crops, of which almost half are ryegrass with an average yield of 500 kg per ha. Other species are Seedmaster yielding 100 kg per ha and Demeter fescue, 500 to 540 kg per ha.

To handle the harvest he uses very large bulk bins with a capacity of 50 tonnes of wheat. These bins were mobile on twelve wheels and were made by Four Farmers Engineers of Kerang, Victoria, and cost \$3,200.

We were shown a 34 spring tyne tiller which cuts 3.5 metres, costs \$650, and is regarded as a very useful implement. Mr. Stoney uses two Class Consul headers for harvesting seed crops.

### 2.15 Drying Seed

On-farm drying of seed appears common in N.S.W. Mr. Davidson in the Lachlan River Valley, has false bottoms fitted to his wheat bulk bins. Warm air from a motor-driven fan is forced through the false floor and through the seed. This method, which is cheap and effective, can be of value to South Australian seed producers.

### 2.16 High Yields - Better Germination

Towards the end of the tour we inspected a perennial ryegrass crop belonging to John and Peter Lidgerwood of Burregurra in the Western district of Victoria. It produced the highest yield of seed in the previous year - just over 1125 kg per ha. Seed had been sown at 10 per ha each way, making a total of 20 kg per ha. Nitrogen was applied at 60 to 100 kg per ha. Rainfall is 750 mm. The crops are windrowed before harvesting.

## 3. NEW CULTIVARS:

### 3.1 Sirosa phalaris

Mr. Emile Gray, Chief Seeds Inspector of the N.S.W. Department, was critical of the release of Sirosa with low germination. We argued it was desirable to have seed from this new cultivar available for sowing, than have it destroyed.

It's seed retention is now recognised as poor - worse than was first indicated. Dr. Rex Oram of C.S.I.R.O., Canberra, said it fitted in between Seedmaster and Sirocco. From our experience it seemed to be more on a par with Sirocco. Dr. Oram pointed out that conditions of growth could affect shattering. He said high fertility, high rates of nitrogen and irrigation could encourage the opening of seed heads of phalaris, thus allowing shattering to occur. He emphasised that nitrogen and irrigation were still beneficial even though some seed loss may occur.

### 3.2 Siro 1146 phalaris

On Mr. Jim Davidson's property in the Lachlan Valley, the hybrid Siro 1146 phalaris started off with a yield of 550 kg per ha in the first year. It has since dropped significantly each year. Last year only 15 kg per ha was obtained!

Dr. Oram said this hybrid has a place on farms on the southern Tablelands of N.S.W., suggesting the bulk of feed it produces works in well with other pastures available. Each farm could have an area of 20 ha to graze in conjunction with other pastures.

He also added he is working on the breeding of another phalaris plant.

### 3.3 Akbar barrel medic

Mr. Arch Gressor, the Seed Production Officer at Cowra, N.S.W., told us of a new barrel medic called Akbar, which is to be released in 1975. It could be suitable for low rainfall (250 to 400 mm), heavy soil areas, such as Kimba.

### 3.4 Haifa white clover

A basic seed crop of this cultivar was inspected on Mr. Horace White's property out from Cowra, N.S.W. It is useful in a 450 mm rainfall, and a yield of 225 kg per ha clean seed was obtained last year. The crop is direct harvested about mid-December and then the seed dried.

Another crop of Haifa was seen on Mr. John Farley's property. Mr. Gressor claimed this variety had a considerable potential, being hardy and more tolerant to weeds.

### 3.5 Bonny blue grass

At a property, "Seaton Vale" near Yarck in Victoria, we stopped to look at a seed crop of Bonny blue grass, a poa species of Kentucky type of creeping lawn grass. Rust was badly affecting this seed crop. It is an early heading variety, but unfortunately establishment was poor, and off-type plants showed up. It is being certified under the O.E.C.D. scheme.

We were also shown a small paddock of an English selection of Italian ryegrass on Mr. Bob Cameron's property nearby. The annual plants produce lush growth. Seed is valued at 55 cents per kg.

## 4. CERTIFICATION:

### 4.1 Area Covered per Day

The N.S.W. seed production officers made the comment, that the maximum an officer can inspect properly is about 240 ha per day. This would be similar to our own work when inspecting fairly large paddocks.

Mr. Gressor, in the Cowra area, stated some 4000 ha of sub. clovers are certified in his area, the main variety being Woogenellup. He serves some 40 Hunter River lucerne seed growers, mainly in the Forbes area. West. Bros. have 800 ha producing lucerne seed.

### 4.2 Record Keeping

This side of certification was discussed, both at Sydney and Melbourne with the respective senior officers in each Department of Agriculture. Mr. John Ballard in Sydney commented, "Keeping records are a humbug but are a must". In N.S.W. most of the details are kept on a card system in the various regional centres, such as Wagga, from where the growers and seed cleaners receive details of the tests. In a book is kept information similar to our cleaners' record sheets, so that by checking this a seed production officer can see at what stage a particular line of seed has reached, i.e. harvested, cleaned, tested or released.

In N.S.W. they do not have accredited cleaners. The seed production officer seals the bags of seed in the paddock. No uncleaned sample of seed is taken. An officer takes the cleaned sample at the processors and does the final sealing. Tags are issued with the analysis number already printed on and sometimes a cleaner is then allowed to put tags on and temporarily seal the bags.

The certification system Mr. Snellgrove showed us in Melbourne seemed to entail a great deal of paper work. We concluded that our own method was easier, just as efficient and preferable. He demonstrated the stamping out of plates for the production of certified tags.

## 5. SEED CLEANING:

### 5.1 Contamination of Seed

At Smyth & Murphy's cleaning shed just out of Benalla in Victoria, there are three main cleaning machines - one for Victorian perennial ryegrass, another for Currie cocksfoot and the third for other varieties. This minimises the chance of contamination when cleaning the former two cultivars.

### 5.2 Automatic Conveyor Systems

The main feature of Wright Stephenson's shed at Winchelsea in Victoria was the method of conveying seed from bulk silos to the cleaning machines. There was a long conveyor belt which could handle seed direct to bulk bins, and then either by conveyor belt or auger from bulk bin to any cleaning machine. Also, there was a pre-cleaning machine to which seed is fed from a conveyor belt and then the seed is stored into weld mesh silos before final cleaning.

A few miles north of Ballarat, Mr. Francis Kinnersley showed us over his somewhat elaborate home-made cleaning plant. It occupied the whole of an old house. Seed was tipped into a large hopper by bulk; it then passed through a pre-cleaner made from an old header. The basis of the cleaning was done by passing the seed through a series of indent cylinders. No gravity table was used. The seed travelled from one machine to another through augers and elevators. The clean seed is stored in a new separate mouse-proof shed. Mr. Kinnersley is recognised as an excellent cleaner.

### 5.3 Use of Bulk Containers

During the visit to Smyth & Murphy's cleaning shed, the manager, Mr. Mick Smyth, showed us "bulklers" - bulk containers made of polypropylene material, similar in strength to wool packs, and when filled held about 1 tonne. These are filled by fitting a frame on a pallet; they are closed at the top and can be moved around without the frame. They could be used several times during each season, and some are now in their seventh season. The great advantage was when empty; large numbers could be stored in a small space. The packs cost \$20 to \$22 each and the frame \$16.

Some certified seed is delivered in bulk bins, dumped into clean bags, and carried to the receival hopper by a bucket mounted on a fork lift.

Before travelling to Melbourne we visited Valley Seeds, also at Yarck, and inspected Mr. Jim Coles' seed cleaning plant. Here, wooden bulk bins of 1 tonne of ryegrass seed capacity are used.

At Wright Stephenson's Winchelsea plant, numerous weld mesh silos were used. When empty these could be folded around into a much smaller size, thus saving space.

#### 5.4 Electronic Colour Separator

The most interesting machine in Smyth & Murphy's shed was an electronic colour sensitive separator, which operates in a dust-proof room. It cost \$800 plus installation and was made in England. The installation took three days at \$11 per hour!

It is very useful in cleaning sunflower seed for health food products to bring the seed up to an even quality in colour. Its output is fairly low - about 20 kg per hour, but is automatic in operation and is the only known method to obtain satisfactory uniformity. This machine is better used for large grains because it virtually separates one seed at a time. It is also used for peanuts and beans.

#### 5.5 Cleaning Capacity

In the above shed, 12 sacks of Currie cocksfoot can be cleaned an hour. All grasses are put through indent cylinders. The plant capacity is from 20,000 to 30,000 sacks a season, being one of the largest in Victoria. They used to operate 24 hours a day, but found the night shift often resulted in poor performance so is now discontinued.

While at Mansfield we were shown through Lloyd Parks' new seed cleaning plant set-up by his manager, Mr. Laurie Kingsley. Four hundred ha are harvested by the owner. Perennial ryegrass is the main seed crop followed by cocksfoot, Demeter fescue and phalaris. Last season, their first year of operation, 150 tonnes of certified seed was produced on the property. Land is also being leased for small seed production.

The peak of the seed sales is usually in February and the first week of March, so the seed must be cleaned as soon as possible after harvest. The storage shed was impressive, being 56 m long x 23 m wide x 11 m high. Large bulk bins are used to handle the Victorian perennial ryegrass.

The cleaning plant is in a separate shed and has an average capacity of 100 sacks of clean seed a day, although up to 135 bags of ryegrass has been obtained in 10 hours cleaning. Demeter fescue averages 320 kg per hour. Working hours are 10 hours a day, 6 days a week. The machinery consists of a Petkas 200 plus Hart Uni-flo cylinders.

Mr. Kinnersley, near Ballarat, cleans about \$200,000 worth of seed a year. The cultivars treated here are Victorian ryegrass, Currie cocksfoot and Australian phalaris. The rate of cleaning ryegrass is over 500 kg per hour.

### 6. SEED TESTING:

#### 6.1 Physical - Purity & Germination

In Sydney, the Department is in the process of moving its Seed Testing Laboratory to a new site. Working conditions in the old building were cramped and poor. The equipment used was similar to that of the South Australian Department of Agriculture, but the cabinets seemed smaller.

At the Seed Testing Station, Burnley, Victoria, Mr. John Snellgrove, the Department's Senior Seed Inspector, introduced us to Mr. R. Hedding, Senior Seeds Officer and Miss Gwen Easton, Senior Seed Tester. The modern type building was well set up with superior testing facilities to ours. The seed analysts work under very good conditions.

## 6.2 Prillcoted Seed

At Burnley they find in testing Prillcoted seed, new techniques are required to obtain the same germination results. This includes drier conditions operating at higher temperatures, 20 to 30°C. Prillcoted seed generally gave better and more rapid germination. Phalaris Prillcoted seed does not like a pre-chilled period.

## 6.3 Testing Seed

In this laboratory vacuum heads are not used because of the risk of fusarium infection in seed. The holes were placed too close - a large head size is needed. In germinating cucumber seed they are placed on special paper from the U.S.A. This paper had good water retention characteristics. We saw bean seeds being tested; they were growing up to 15 cm in five days in a temperature of 25°C. The Victorian Department has included a bean certification programme in their scheme. About 7,000 samples a year are tested in the laboratory.

Mrs. Elizabeth M. Felfoli, Seed Testing Officer, is writing up descriptions and control measures on weed seeds. She showed us their excellent collection of all kinds of seeds, including one of restrictive weed seeds. These were well presented with an efficient filing system which made finding of the specimens quick and easy.

In a special dark room, seed could be viewed on glass plates over two 50 watt globes, using a 7.5 cm hole for viewing. When sorting into trays, seed is examined using light blue paper as a background.

## 6.4 True to Type - "Grow-on" Testing

### 6.4.1 Plot testing at Temora, N.S.W.

To us the most interesting work on the Temora Agricultural Research Station (north of Wagga), was the post-control testing. Mr. David Appleyard explained this was their first full year of plot testing. Two methods are to be employed in future tests.

One method is conventional, whereby plots are sown and grown out to maturity or at least to flowering stage. The plots were well laid out and cared for. Sub. clover and medics were sown in single rows 7 m long, spaced 1 m apart. A single row, push-type cone seeder is used for sowing plots. This machine can be easily cleaned out between different lots of seed. Counts of off types are done by sitting on a small trolley which straddles the rows of clover or medics. This makes the job easier and quicker.

At this Station all registered cereals are also grown as a check on varietal purity and vigour.

The second method of plot testing is to be conducted in a shadehouse area. It is hoped to be completed in a few weeks and will be similar to the one used at Burnley near Melbourne. In this latter method, grow-on work will be carried out better in the drier months of the year. The shed frame was made of pipe. The grow-on boxes are made of cement and are on waist high frames for ease of doing counts. There was a wooden frame with 100 evenly spaced holes to assist sowing.

#### 6.4.2 The "grow-on" nursery at Burnley, Victoria

Mr. John Snellgrove in showing us their plots, said they could get results from sub. clovers and medics within one month. They use a well set-up shadehouse of about 2.5 m high with tubular piping frame. There are a series of concrete benches, waist high, 20 cm deep x 75 cm wide, resting on concrete supports. These benches will allow 15 cm of soil for grow-on tests. There are 15 benches, each about 18 m long and the total bench area is about 170 sq.m. The shadehouse area covers nearly 400 sq.m.

Holes are placed in the soil at 5 cm centres and three seeds planted per hole for medics and sub. clovers. Grasses are sown in 12 cm rows and 5 cm apart within the row. One bench is electrically heated for the colder months. The floor of the nursery is covered with quarry rubble. Soil is sterilised annually with formalin and a trace of Benlate(R) is placed in each hole at sowing. Several grow-on tests are carried out on each bench every year, but generally alternating clover and grasses. The soil consists of a mixture of 50/50 loam and sand.

Two samples are drawn at the seed cleaners and both are "grow-on" tested. All legumes are inoculated.

#### 6.4.3 Checking plots

When checking clovers early, about the second true leaf stage, they mark those plants that appear to be off type. Odd plants that cannot be identified at the early stage are grown out to maturity for interest sake and possible identification. However, Mr. Snellgrove stressed they were not really interested in identifying off types or what the other strains are, but were only concerned that the percentage of off types is less than 5 per cent.

### 7. SEED RESEARCH:

In addition to research work on disease, seed retention of phalaris, etc., the Victorian Department is also studying research on seed drying, storage and the effect of temperature on quality of seed. Experimental work on seed pelleting and coating is being investigated. Also seed damage due to harvesting is being looked at, particularly with beans and lucerne seed.

### 8. GRAZING TRIALS:

Pasture grazing trials are being conducted at Temora Research Station. Phalaris sown at 2 kg and sub. clover at the same rate with 125 kg of super were carrying 11 sheep per ha. A lucerne clover mixture at the same stocking rate was the best for wool and meat production. Phalaris staggers is higher on Sirocco phalaris than Australian phalaris.

We were interested to find at Ginnindara Research Station, near Canberra, lucerne again gave very good results, either as lucerne and clover or lucerne and a grass mixture. Lucerne sown in rows 60 cm apart with phalaris and sub. clover in between was the best.

#### 9. REGIONAL ADMINISTRATION:

We had an interesting discussion with the Regional Director of the Department of Agriculture at Wagga, Mr. Joe Madson, who outlined the principles of regionalisation, its aims and problems. Both N.S.W. and Victoria have large regional centres fully serviced by Agronomy, Soils and Animal Health personnel.

Again at Benalla in Victoria, we talked round the same topic with Mr. David Cannon, Senior District Officer, who is Officer-in-Charge of the Regional Centre. He explained some of the problems of regional centres and some of the functions they are performing. Their policy is to co-operate with groups like Lions, Apex, Farmers and Graziers, etc., in conducting courses on subjects such as probate and estate planning, using Departmental economists. Town and country planning authorities ask the Department to inspect proposed subdivisions and report any problems. An attempt is now made to keep prime land for rural development only. They find as we do, that hobby farmers are hard to service.

Mr. Cannon suggested a regional centre can become partly ineffective if there are too many officers in the area. He felt it then became difficult for a regional director to keep up with all the extension work officers were carrying out. Thus co-ordination of work was not easy.

#### 10. DISCUSSION:

The study tour was well organised by our hosts, the Departments of Agriculture in both N.S.W. and Victoria. The hospitality extended to us was very good. Besides what was planned, there were many things which just "cropped up" that were of particular interest.

Our extension type approach to certification regulations appears to us more effective than the approach of the seed production officers visited in the eastern states. This may be because in those states officers are more concerned about policing the Seeds Act and certification regulations, particularly in Victoria.

Our technical knowledge of growing seed crops and of weed control is well abreast of our eastern states' counterparts. This is shown by the fact they both use our pasture seed crop weed control charts and recommendations.

It was perhaps comforting to learn they are experiencing the more difficult problems we are coming up against, for example, the problem of increasing contamination by other varieties in our certified annual clovers and medics.

On the other hand some of the main points we learnt or consider investigating are:-

- \* Encourage growers to grow those cultivars that appear likely to be in short supply
- \* The urgent need to develop mother lines of annual clover and medics



- \* Basic seed must always be used in preference to first generation, thus encourage the production of basic seed
- \* A possible potential for growing Haifa white clover and Akbar barrel medic seed
- \* A new herbicide, Roundup(R), a Monsanto product, has a terrific potential, but is expensive and not yet available.
- \* Clover scorch or Kabatiella can be controlled by spraying Benlate(R), a DuPont product
- \* Bacterial wilt is never found in lucerne seed, but is readily spread by machinery (contractors)
- \* Liberal dressings of nitrogen and irrigation probably aggravate seed shattering of phalaris
- \* Experiment with the spraying of phalaris for seed retention using the Monsanto product, AF 1510
- \* Windrowing of phalaris to obtain higher seed yields
- \* High yields, especially with Victorial perennial ryegrass seed crops, seem to be associated with high germination
- \* Avoid seed contamination by:-
  - \*\* Growing only one cultivar of a species per property
  - \*\* Keeping grazing stock and machinery to handle only one cultivar as far as possible
  - \*\* A good clean down of harvesting and cleaning machinery between different cultivars of certified seed - considerably more time should be spent in this way by our harvesters and cleaners
- \* The drying of seed in bulk bins could be of greater interest to our grass seed growers
- \* In the cleaning shed, night shift work is usually associated with some poor performance work
- \* Polypropolyne bulk containers have many advantages, such as low cost and can be stacked away into a small area when not in use
- \* Keen interest was taken in the "grow-on" work we saw and fairly detailed notes were jotted down - these should help in developing this section of our service.