The NZAEI NEWSLETTER

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The 1970/71 Institute Work Programme

This year the Institute's Work Programme includes a considerable number of mechanisation projects, continued work connected with the application of fertilisers, herbicides and insecticides, and a variety of water resource and water usage projects.

Projects concerned with tractor safety include a continuation of the existing programme to assist in the establishment of a sound International Standard Organisation test procedure for wheeled tractor frames and a national test procedure for frames fitted to crawler tractors. The study of tractor noise in relation to safety frame design which is already under way will be maintained. Investigation of tractor accidents will this year be limited to checking the performance of certificated safety frame designs.

The emphasis on row crop mechanisation will be horticultural and particularly directed towards process crops. Connected with this will be the development of associated equipment for local manufacture. In co-operation with the College farm staff high grade fodder beet seed will be produced. A precision drill advisory service will be introduced which should be of assistance where there is any doubt in setting up the drill for use with particular seeds.

Studies are to be made of existing mechanisation techniques which can be applied to pip fruit growing. Work will be continued in developing a blackcurrant harvester, a raspberry harvester and more development will be carried out on the improved performance windmill. The Institute will also take part in feasibility studies of mechanical methods of harvesting lake weed in the Waikato hydro-lake system. In all of these projects the Institute will be working in conjunction with the Department of Agriculture, the Department of Scientific and Industrial Research and in the case of the lakeweed problem, with the Electricity Department.

The testing programme concerned with fertiliser and insecticide spreading machines will continue together with the development of improved spreading devices, the study of particle ballistics and an investigation into the best material gradings for manufacture. In co-operation with the Department of Agriculture development of sub-surface application machinery for insecticides and fertilisers will continue. The research programme aimed at the development of equipment and techniques for the measurement of the distribution of spray materials from aircraft will continue under the direction of Professor Yates of Davis, a campus of Berkley University.

The Soil and Water section of the Institute will be continuing studies of orchard irrigation in Nelson in association with the Fruit Research Division of the D.S.I.R. The establishment of a field lysimeter network is to go ahead and there will be investigation into trickle and spray irrigation methods. Several water conservation studies will be carried out. In association with the Agricultural Engineering Department of the College studies of drainage, flood estimation and erosion will continue.

The development of low-cost fencing techniques will be continued together with the commencement of long-term trials to determine the durability of fencing materials.



The Director explaining a point in fencing methods to Prince Philip.

National Farm Machinery Field Days — 1970

The second of the National Farm Machinery Field days was held at Rukahia from the 23 to 25 March. This year the field days extended over three days—an indication of the sucess of the initial show held last year.

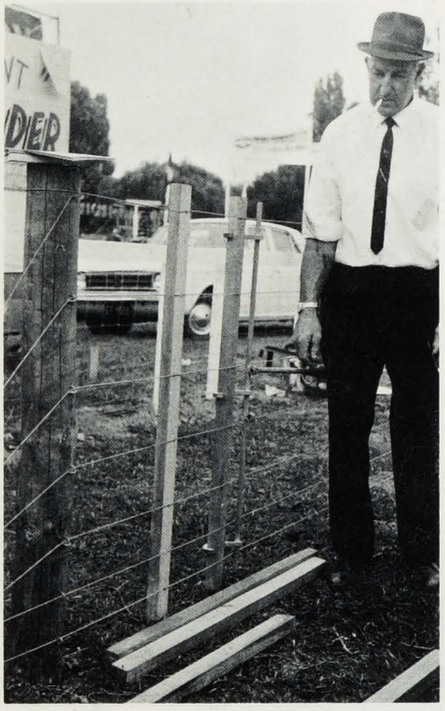
The Institute was again represented by a stand among the exhibitors where publications, publicity and photographs of Institute activities were on display and where information concerning the Institute, membership scheme and activities could be obtained. Professor Burton and Keith Humphries served as two of the judges for the National Farm Fencing Contest and were assisted in the strength tests by Bill Fitzharding-Jones.

The weather on the three days was fine and warm and encouraged visitors. The highlight of the demonstrations was a live tractor roll carried out with the aim of showing that a safety frame does protect the driver. The tractor was driven by Mr Brian Belcher wearing a safety helmet and strapped in his seat. He drove the tractor along a steep slope bringing the nose around until it became unstuck. The tractor rolled through more than 360 degrees and came to rest on its side after which Mr Belcher unstrapped himself and walked away. It would have been a foolhardy driver who would have carried out such an act without a safety frame and it is most likely that many farmers among the onlookers were impressed.



The Director and Keith Humphries making a test during the course of the fencing competition.

The major attraction of the last of the field days was the visit of the Queen and the royal party. The informal visit lasted for an hour or so and the party had lunch at the grounds. The Queen and Prince Charles and Princess Anne spent some time watching the fencing contest and showed considerable interest with their attention and their questions.



This batten holder won first prize in the Practical Aids to Primary Production Award.

Calibration Service for Precision Drill Users

The workshop staff of the N.Z.A.E.I. have recently built a calibration rig which gives an accurate visual indication of the performance of a precision seed drill unit. In its present form it will only accommodate units of the Stanhay drill, but the mounting brackets and drive may be modified at a later date to accept other manufacturers' units as well if the numbers in use warrant this.

The accompanying photograph shows the layout of the rig. The drill unit is mounted at one end of and above a 5-inch wide endless plastic coated belt which runs on crowned rollers at 128 inch centres. A variable speed electric motor drives both the drill unit and the endless belt but the ratio between the two can be varied to simulate the four alternative unit drive speeds obtainable on the master-land-wheel drive.

To trap seeds and prevent bounce, as they fall from the unit, a band of grease is smeared onto the centre of the belt and this is spread evenly by a narrow idler wheel on the return side. Seeds are removed from the greasy band by a simple scraper at the end farthest from the drill unit. A 100 inch scale is fitted alongside the belt.

The rig will be used as an aid in the N.Z.A.E.I. row crop mechanisation programme, but at the same time the facility will also be available to any grower who wishes to know the best possible belt, base and choke combination to use in his Stanhay drill for any sample of seed. The drill manufacturers supply full instructions as to which belt cell size, base and choke to use for a wide range of crop seed but the recommendations can only be a general guide because of the natural variation in size and shape which occur due to variety season and environment. An accurate determination of the best settings can only be obtained by putting a sample of the actual seed through the drill while running at the appropriate speed and trying various belt cell hole sizes, bases and perhaps chokes.

A full range of belts, bases and chokes has been provided by Howard Rotovators, the New Zealand agents for Stanhays, so that any combination can be obtained.

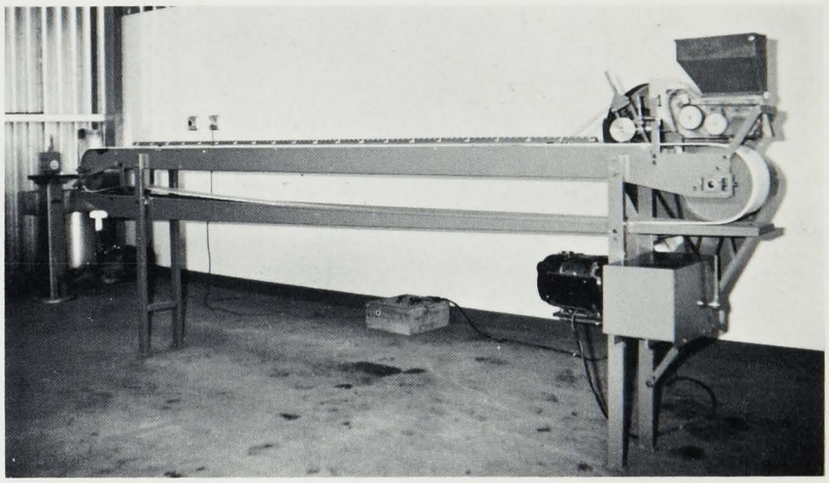
Growers wanting to use this service may write for application forms which list the questions we would like answering for each sample of seed if we are to be able to help fully, e.g. drill model (unit or master landwheel drive), seed spacing required, belts, bases and chokes available, preferred speed of travel, etc. If these are returned with seed samples (1 to 2 ounces of small seeds, 4 to 8 ounces for larger ones) we will list the numbers of single and multiple seed deliveries and misses at different speeds and settings, and recommend the best setting to produce the required spacing.

If it is possible to improve the performance with any specific seed sample by grading to reduce the seed size range this may be done and the appropriate recommendation made.

Although the suppliers of coated or pelletted seed usually state the final size grading of the processed seed, a calibration is still useful if an accurate placement is required.

It is hoped to send recommendations by return of post following the receipt of samples so that sowing will not be delayed by the use of this service.

A nominal charge of 50 cents will be made for each sample of seed submitted.

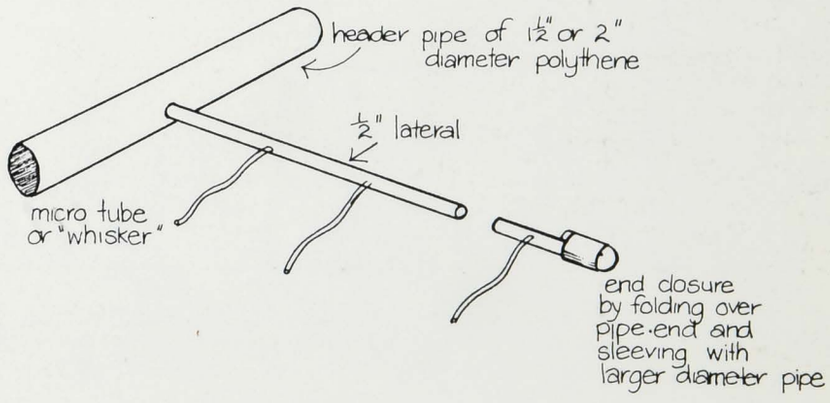


The precision drill calibration rig. The drill feed can be seen on the top right of the machine with a portion of the endless belt directly below. The scale can be seen running along the full length of the upper surface of the belt.

Trickle Irrigation

After seeing trickle irrigation on a field scale under development at the Scoresby Horticultural Research Station in Australia in June 1969, John Dunn put in a small trickle lay-out on vegetables in a commercial orchard at Loburn and another in part of the horticultural department orchard at Lincoln.

Considerable interest was aroused by this work and enquiries have come in from Auckland, Bay of Plenty, Gisborne, Hawkes Bay, Manawatu, Nelson, Blenheim, Canterbury and Central Otago. Fruit growers are particularly interested and it would seem to be especially



The basic components of a trickle irrigation system.

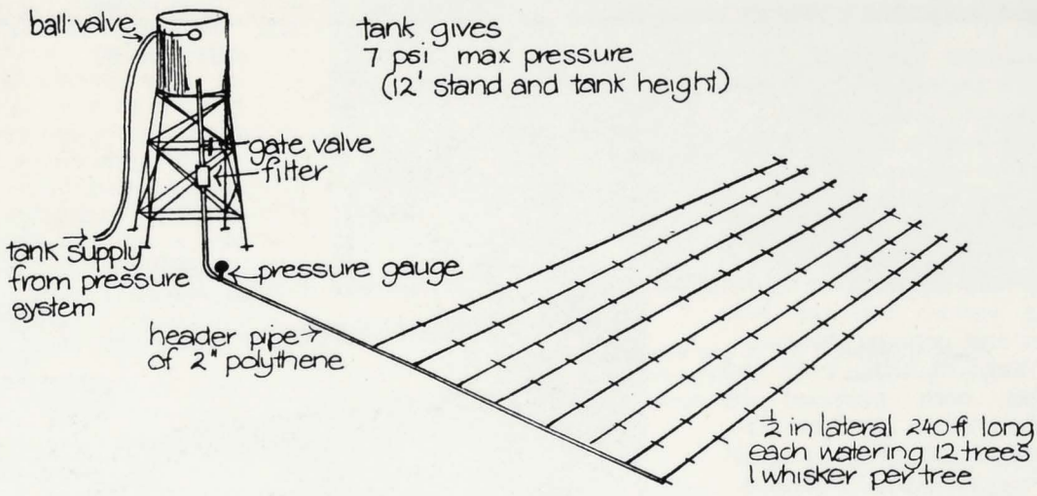
suited to their type of cropping. A permanent irrigation system can be installed for very much less than would be required by conventional fixed sprinklers and the much more efficient use made of the applied water means less water is needed. Supply pressures are also much lower so that pumping and pipe costs are materially reduced.

The 1970/71 season shall add considerably to the knowledge we have gained so far. Investigational installations will be going in on commercial crops of blackcurrants, raspberries, strawberries, plums, grapes and peaches around Christchurch and the 1 acre plot in the Loburn orchard is being expanded to over 100 acres. More than 50 miles of pipe will be needed to water the 13,000 trees on this area.

One interesting exercise will be the installation of trickle on a hillside orchard in the Horotane Valley. From road level this property rises 340 ft in a distance of 1100 ft. Shallow soil and the ever present problem of run-off have severely limited the use and benefits of small scale sprinkler irrigation previously. Trips up the hillside to move the sprinklers at hourly intervals have also effected the efficiency of the grower in no small way!

While no running problems have arisen with any field scale trickle installation to date, only clean water sources have been used. It is known, however, that blockages have occurred in some glasshouse trickle installations using metal Cameron nozzles and their N.Z. equivalents, but in all cases chemical feeding was being practiced. Soluble iron salts, algae, and bacterial slime have variously contributed to these blockages. Proprietary materials to control algal and bacterial growth in water systems have been used, but were not always wholly satisfactory.

Whether such blockages will occur with problem waters in the polythene whiskers of field trickle systems remains to be seen. Whisker replacement would be simple and cheap but any uncertainty in performance could nullify the benefits of the system. It is certain, however, that very careful filtration would be needed where open water sources are to be utilised. A simple filter with a large throughput at low head loss for this purpose is being tested at the Institute at the moment.



A schematic layout of a one-acre trial area of trickle irrigation in a Loburn orchard.

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