NZAEI NEWS

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EDITORIAL

If you would like to comment on any of the items appearing in the Newsletter, or on the work of the Institute, please write to:

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The Information Officer will also handle address changes and requests for the Newsletter or other NZAEI publications.

HARVESTING

Apples

During the winter months support netting on the old canopied rows of Red and Golden Delicious, Granny Smith and Splendour has been replaced by 2.5 mm high tensile line wires. The trees have been pruned and trained and with the exception of Splendour all trees have been a mass of bloom. The blossom on trees planted within the past two years was removed to encourage new growth rather than fruit.

Three new rows for canopy training have been planted (Red Delicious on MM106, Golden Delicious on MM106, and Golden Delicious on MM102). These will eventually replace the old Red and Golden Delicious trees which have suffered from being decapitated three times over the development period.

Raspberries

A bi-wall system of trickle irrigation has been installed on the five canopy trained rows of Marcy at Tadmore, and MAF advisory officers from Nelson will supervise its use. An upright row alongside is to be similarly watered as a comparison. The Mark 2 harvester will be taken to this site in December. Construction is complete except for sorter seating and the tray filling magazine, and running up trials have been successful.

The bulk of the new raspberry planting on the College Horticultural Research Area was cut back to stimulate the growth of new canes to be trained on to canopy next winter. Canes on the small area remaining have been laid down on half canopy for harvesting this season. Subsequent cane growth and yield will be compared.

AGRICULTURAL AVIATION

Emergency Dumping of Lime

Full scale tests with the one cubic metre Fletcher hopper have emphasised the adverse effects of vibration on the flow of lime and the importance of the opening dimensions of the hopper outlet. The main conclusion is that particle size has a marked effect on the nature of the flow from the hopper. Some form of granulation or pelleting, which would still allow a rapid breakdown of the lime once it has been applied, would improve the flow rate.

A 16 mm cine camera was fixed to the undercarriage of a Fletcher aircraft by means of a specially made mounting to record the way in which the lime leaves the hopper while the aircraft is in flight. The first films showed where a number of improvements could be made. In particular, the rear door of the hopper outlet interfered with the flow.

IRRIGATION

The Wheel Irrigator

Because of the good performance of the new type of water motor under test, two more of the motors will be installed on the moving sideroll irrigator. One auxiliary drive unit has been converted to the new system and the main drive unit is being fitted with twin water motors and a petrol motor-hydraulic drive system for moving the irrigator when empty of water.

Application Rates under a Moving Sprayline

The application rate for a conventional static irrigation system is defined as the total volume of water applied, divided by the time of application. For a continuously moving sprayline, however, this definition does not give a true picture of the situation, and from the point of view of soil intake rates, the "instantaneous" application rate may be more important.

To study this a small moving irrigator was built which allowed any sort of water distribution device to be fitted, and which could be moved forward at any selected speed. In the initial study two sprinklers for which still air distribution tests had been done were used. Catch cans were used to record the average application depth, and two recording raingauges were used to record changes in the "instantaneous" application rates.

Glenmark Irrigation Scheme

Work on the Glenmark Irrigation Scheme was officially opened by Mr D.F. Quigley, M.P., at Waipara on 5 November. Construction is planned over a three-year period. Terry Heiler has been engaged in discussions with the consultants, about final sizing of scheme components, based on the computer modelling work carried out during his duty leave period in Brisbane.

ETHANOL FROM CROPS

Agronomic Trials and Harvesting Equipment

The Liquid Fuels Trust Board is financing an Institute study of the harvesting and storage of beet as part of a larger research programme into beet production at Lincoln College. The purchase and demonstration of beet harvesting equipment make up a major part of the study. A three hectare block of beet has been planted for the storage trials, and twenty hectares of a commercial crop has been made available for demonstrating the harvesting system.

A three row harvester, a cleaner loader, a tractor mounted slew loader, and a high lift trailer have been selected as making up a system of sufficient flexibility to allow the Institute to examine various harvesting and beet handling methods from growth through to the road transport of harvested roots.

FENCING

Durability Trials

At Mid Dome a considerable number of line wires had broken at the point where they had been tied off. Only the galvanised wires had failed; there were no failures among the ungalvanised line wires. The untreated pine posts are still in reasonable condition at this site and do not yet need replacing after seven years, unlike those at all the other sites. This site is 1300 metres above sea level and is covered in snow for a large part of the year.

Electric Fencing

We have recently learned of new developments in additives for plastics which may improve their resistance to ultra-violet radiation and weathering. These additives may increase the life spans of some of the cheaper polymers to the point where they are suitable for permanent fences. More information is being sought with a view to extending the present insulator trials.

Three fences, on which line wires have been attached to posts without insulators, have now been erected on the campus trial sites. These fences are identical except that one is supported on Insul stakes, one to pine stakes treated with Tanalith NCA, and one on pine stakes treated with 5% PCP plus heavy oil. Another group of stakes treated with a different type of oil based preservative is to be installed shortly, and is hoped to include stakes treated with AAC compounds. The insulating properties of these fences will be compared with a fence that has conventional insulators.

TRICKLE IRRIGATION INSTALLATION MANUAL

In 1973 we were fortunate in having Graham Jobling spend a sabbatical leave with the Institute preparing a Trickle Irrigation Design Manual. This manual was published in two parts in 1974. Since then it has sold steadily to customers all over the world from Spain to Saudi Arabia and from the United States to Zambia. It has, in fact, been our best seller.

Now, to complement the Design Manual John Maber has written a Trickle

Irrigation Installation Manual. This outlines the steps involved in the installation of a trickle irrigation system and described in detail important aspects of pipe laying and joining. The publication is copiously illustrated and we hope that it will be found as useful as the preceding Design Manual. The price is $3.00 and it may be obtained from the Information Officer.

STAFF

●Rob Stellingwerf has joined the staff as a Temporary Research Officer. He will be concerned mainly with safety frame testing.

●Dale Vanderholm arrived in late August on sabbatical leave from the University of Illinois. He is already engaged in the preparation of a manual on agricultural waste management.

●Ken Smith, MAF, United Kingdom, has arrived for a twelve month exchange visit. He will be working with Graham Harrington's group and will be participating in the joint NZAEI/MAF research into waste management.

●Terry Heiler has arrived back from duty leave in Brisbane.

●Peter Steele has been awarded a Lincoln College Foundation Award to enable him to observe European and American beet harvesting and storage practice.

WASTE MANAGEMENT

Lagoon Monitoring

The anaerobic lagoon at the College dairy is now about three quarters full of sludge, but as yet no loss in performance has shown up.

The evaporation and seepage trial has produced some interesting information. Fluctuations in the lagoon water level appear to be associated with large bubbles of gas being released from the sludge layer.

Water budgets indicate that about 5 m^3/day of water is flowing into the anaerobic pond from groundwater sources. The evaporation trial results, comparing clean water with lagoon water, were inconclusive, but the trial will be repeated later in the summer.

Changes in water level due to raw wastes flowing in can be easily identified on the level recorder. By calibrating the lagoon we now have a very simple and effective method of measuring the raw waste inputs.

The effect of dumping whole milk is being investigated, using three one-cubic-metre water tanks as lagoon models. These tanks are fed daily with wastes collected from the College dairy farm, using the effluent sampler. After an initial stabilisation period, one dose of milk was added to one tank, the second tank received milk daily, and the third tank was a control, receiving raw wastes only. Results so far show that one dose of milk has no significant effect on the model lagoon. After 2 weeks of continuous dumping there was a serious odour problem, and the pollutant load discharged rose markedly. However, only full scale trials will confirm the exact quantity of milk that can safely be dumped in farm lagoon systems.

RECENT PUBLICATIONS

Miscellaneous Publication

Maber, J.
Trickle Irrigation Installation Manual.
August 1979. Misc. 8. ($3.00).

PAPERS BY NZAEI STAFF

Steele, P.E.
"Yes, it was a hoax, but ...".
Straight Furrow, 40 (15), August.

Steele, P.E.
"What's new in Big Bales".
Straight Furrow, Farm Machinery and Equipment Suppliment, 40(19), October.

Steele, P.E.
"Power Farming - Tractor Economies Under Examination".
New Zealand Journal of Agriculture, 138(10), October.

Young, R.W.J.
"Turbocharging tractor engines".
New Zealand Farmer, Vol. 100, No. 15.

Dunn, J.S.
"Mechanised Bramble Harvesting".
Proceedings of Seminar on Bramble Fruits, Hamilton, July 1979.

HERE AND THERE

●John Maber spoke at an Air Safety Seminar on *Drift from Aerial Spraying*, and on the emergency jettisoning of lime from agricultural aircraft. The seminar, organised by Phoenix Aviation in Gore, was attended by over sixty pilots and company managers from the region.

●Ian Woodhead attended a Poultry Technical Seminar in South Auckland sponsored by the MAF and presented a paper entitled *Automatic Blind Control*.

●There have been enquiries regarding handling equipment for beet, diesel alternatives, nut harvesting and processing, New Zealand salt as a fertiliser for beet, poplars for shelter, automatic bagging and weighing for potatoes, and garlic mechanisation.

TESTING AND CONSULTING PROGRAMME

Protective Frames and Cab Testing

During the period nine safety frames were tested; of these two failed. In addition to the seven successfully tested frames, reports were issued for a further fourteen. Five of these frames had Australian approval and three had OECD approval; the remaining six reports were extensions of existing Certificates of Approval. Considerable interest has been expressed by manufacturers in testing to the OECD standard. Equipment is now being manufactured and a frame has already been submitted for testing in anticipation of the amended Regulations coming into effect.

NUTRIENT CHEMICAL APPLICATION

A Nodet Gougis pneumatic, full-width fertiliser distributor, the first in the country, has been tested in the Still Air Laboratory. Four different fertilisers, as well as a superphosphate/grass seed mixture, were put through the machine. The superphosphate/grass seed mixture and ammonium sulphate were also tested outdoors in a strong northwest wind. Distribution both out and indoors seemed good although the test results have yet to be analysed.

ORCHARD SPRAYERS

A preliminary study of the performance of an air-blast sprayer has been completed. The work concentrated on the air velocity profiles at different fan speeds, and the rate at which the velocity decreases with increasing distance from the fan. The effect of different forward (ground) speeds was also studied.

SHELTER FOR LAMBING EWES

If artificial shelter, using one of the fabrics developed for horticultural windbreaks, was available for ewes, lambing losses in bad weather might be reduced.

With this thought in mind a trial was made using Polymesh Leno fastened to wires fences 0.9 m high. Polymesh Leno is an open interlocking fabric woven from plastic. It is said to reduce wind speed by up to 50% for a distance greater than ten times the fence height.

Three hundred and sixty four ewes were lambed in the paddock containing the shelter fences and the same number were lambed in an adjacent control paddock where there was no shelter.

For most of the trial period the weather was reasonable except for the weekend 15-16 September when temperature fell and there was rain driven by a strong south west wind. On that weekend 22 lambs died in the control paddock and 10 in the paddock containing the shelter fences.

By the end of September 365 lambs had been born in the control paddock with 303 being docked (62 deaths). In the shelter paddock 357 lambs were born 322 docked (35 deaths).

Although of course no conclusions can be drawn from this single trial the results do justify repeating the work next year.

If the trials point the way to reduced lambing losses then the durability of the Polymesh Leno is of prime importance. In this connection winds gusting to 60 knots were recorded on 21 September but even though the wind blew almost directly at right angles to the windbreak fence little damage was done to the material. Later a 45 m length of the material, originally used on a shelter fence, was attached to a sub-division fence at Ashley Dene, to see how it would withstand the weather. The material is still in position and so far seems to have been little affected.