NZAEI NEWS

NO 9 *An informal account of current activities* MAY 1978

EDITORIAL

This edition of NZAEI News coincides with the centenary of Lincoln College on whose campus we are based and with whom we share many facilities. Much of our work has been on display during April and March for the public and the many distinguished visitors to see.

We have continued a policy of encouraging greater farmer and industrial interest in our activities by undertaking to provide a regular display at the N.Z. Fieldays, held in Hamilton in June. This year we shall be midfield and not out in the back blocks, so if you are travelling to Hamilton please make a point of calling in to see what we have been doing.

In this NZAEI News, instead of describing a project, we have included a short description of each item to be displayed at the Field Days.

Correspondence arising from our exhibition, or for that matter from any aspect of our work (or agricultural engineering in the widest sense) is always welcome.
Write to:

The Information Officer
NZAEI
Lincoln College
Canterbury.

He will also deal with address changes and requests for the NZAEI News or other publications. If you would like a closer link with us we operate an NZAEI Membership scheme for the cost of a few dollars annually.

HAY HANDLING

A visit was made to the round bale weathering trial, at Hari Hari in Westland, in March. Rainfall has been light and little difference was observed between the exposed bale and the two fitted with plastic covers. There was also no discernible difference, after a month of storage, between the bale covered with the woven plastic cover and the one beneath the impervious cover.

TRACTOR SAFETY AND OCCUPATIONAL HEALTH

Discussions have been held between the Institute and the Director of the National Audiology Centre on alternative methods for the measurement and control of noise levels in tractor cabs.

CULTIVATION

Preliminary plans have been made for more economy of cereal-cultivation trials, beginning in May. This will be the third consecutive year that trials of this type have been undertaken.

A new power harrow has been lent by Gallagher Engineering of Hamilton for use in the forthcoming cultivation trials and in the high country tussock oversowing investigation which began last year.

HARVESTING

Raspberries

Variety trials for mechanized harvesting, based on the Lincoln horizontal canopy

system,will be laid down at the Riwaka Research Station in the Nelson area. This was decided at a meeting held in Wellington between the Institute, DSIR and MAF. A grower at Tadmore has also agreed to convert one third of a hectare of Marcy variety to canopy growth for the 1978/9 harvest.

Apples

Red Delicious, Golden Delicious, Granny Smith and Splendour varieties growing on the new 'H' canopy system have been available for harvesting trials. Apple removal, using both the pneumatically operated machine developed last year and a simple hand striker, has been successful.

Comparative yields between Red Delicious on four growing systems have shown highest yields for supported centre leader and Lincoln Canopy. Treewall and conventional centre leader systems were 20 percent lower in yield.

Tomatoes

The second prototype tomato harvester worked well in trials recently undertaken in Hawkes Bay, and achieved a harvesting rate of 10 tonnes an hour. The harvesting season was dry this year and this gave rise to the main problem experienced, that of soil clods. Modifications were made to eliminate soil clod pickup by the harvester. The removal of tomato haulm from the shakers, and mower blockages when working in tomatoes following maize, were lesser problems.

There is no manual sorting facility on the harvester yet the quality of fruit collected was considered equal to the sorted fruit for processing in previous years.

PARTICLE AND SPRAY DISTRIBUTION

The fluorescent particle project and the trial work with an ultra-low volume sprayer on gorse have been completed and reports have been prepared on each.

Project work has begun, in cooperation with the MAF, Civil Aviation Division of the Ministry of Transport, and the Chemical Division of the DSIR, to investigate the jettisoning of lime from aircraft.

IRRIGATION

Field testing of the wheel irrigator has continued and the machine has been modified to enable it to move under its own power, but with the sprayline empty of water. Recent heavy rainfall has provided good conditions for continuing the study of the capacitive measurement of soil moisture.

DRAINAGE

Greater usage of the TG1 Trenchless Drainlayer may result from a recent field demonstration supervised by Institute staff in Southland.

The *Field Drainage Guide* compiled by Vince Bidwell has now been printed.

WASTE MANAGEMENT

The *Vibar* screen designed by the Institute for use at Ruakura No. 5 dairy is no longer required there and may be transferred to a nearby pig unit.

The first of two waterwheel effluent samplers has been built and it is at present being tested and calibrated prior to installation at the Lincoln College dairy unit.

ENERGY FARMING

Initial trials in the ethanol project look promising. Flocculating yeast was proposed

for use in a laboratory scale tower fermenter that is now under construction.

The harvesting systems used for sugar beet, fodder beet, macrocarpa, gorse, lucerne, pasture, maize, peas, and straw have been examined for their suitability for ethanol production. The examination has assisted in establishing a methodology in which network analysis techniques are used to cost both individual activities and the whole system.

ROW CROP MECHANIZATION

The four and a half tonnes of fodder beet seed harvested in January is now being cleaned, rubbed, and graded before packaging for sale. Germination testing of the seed is yet to be made. However, germination of the three hectares of fodder beet sown for the 1979 seed crop has been good. Venzar was incorporated prior to drilling and the crop has been hoed to remove volunteer cereals.

HERE AND THERE

A strong international flavour has characterised recent visitors to the Institute. Amongst numerous farmer, academic, and business visitors many have come from Canada, Japan, the Phillipines, Turkey, the UK, USA and the Soviet Union.

George Davies retired from the Institute early in May. We begin to feel our age (15 years old this year) when long serving staff leave to go into retirement.

Our Mazda 808 station wagon was replaced in May with a similar model. The car had done 100,000 km and travelled the length and breadth of the country, in the hands of many different drivers, without trouble or any major repairs.

Temporary Research Officer Les Anstis, from Australia, has joined our staff and is now responsible for tractor safety frame testing.

Assistance was given to TV 1 in the production of a *Country Calendar* programme on the mechanized feeding of large hay bales. This was screened on 21 May.

RECENT PUBLICATIONS

NZAEI INTERNAL REPORTS:

87. SCRCC Wind erosion research contract - final annual report to April 1977 ($1.00).

PROJECT REPORTS

P/16 Field Drainage Guide. V.J. Bidwell ($2.50).

NZAEI ANNUAL REPORT 1977

This enlarged (72 page) report contains an account of the Institute's first 15 years. It is well illustrated and produced. ($1.50).

G.J. Harrington. Contouring and Earthwork Estimation for Bordered Strip Irrigation. NZAEI Theses in Agricultural Engineering No.2. ($5.00).

PAPERS BY NZAEI STAFF

Steele, P.E. and Pratt, T.H. *Large Bale Feeders*. N.Z. Journal of Agriculture, 136(4), April 1978.

Painter, D.J. *Mucking out in the 1980's*. N.Z. Farmer, 99(7), April 13, 1978.

Humphries, K.R. (Technical Consultant). *Guide to Fencing*. Supplement to the N.Z. Farmer, 27 April, 1978.

1978 NEW ZEALAND FIELDAYS
EXHIBITION - HAMILTON

TOMATO HARVESTER

Our tomato growing areas were more likely to expand if a simple and reasonably priced harvester was available. Our current tomato harvester has evolved by taking advantage of a shaker mechanism developed at the Institute for use in soft fruit harvesters, attaching it to a tractor and providing it with an elevating and conveying system.

Power transmission from tractor to harvester is hydraulic. By disconnecting the harvester from the tractor out of season, the tractor is available for work throughout the remainder of the year.

DAIRY EFFLUENT SAMPLER

Working on the principle of water wheel designs used by the ancient Persians the Institute has developed a pump that can be left unattended in an open effluent channel. It provides a representative sample of dairy effluent each time the yard is sluiced down.

FENCE BATTEN MACHINE: THE *TYAWIRE*

Four years of design, development and testing have been invested in the *Tyawire* machine which is now in commercial production. The machine is included for the first time in the two-man fencing trials to be held on Saturday 17 June. On current retail prices wire droppers are less than one quarter that of comparable wooden ones. The retail price of the machine is $245.00.

BALE BUGGY

Because of our unique and extensive livestock farming methods we have had to consider, almost exclusively, machinery that would feed out the large hay bale to a mob of stock. The Bale Buggy represents the Institute's interpretation of simplicity and low cost among the more than 30 different feeders currently available in the country. Feed out at speed, over a distance of up to 1000 metres, and from the comfort of a utility or wagon are features of the Buggy performance. Five manufacturers throughout the North and South Islands are producing this machine.

VIBRATING SCREEN

Dairy effluent pumps were never designed to handle pieces of wood, rocks or discarded hypodermic syringes. By screening these out before they reach the pump with a self cleaning *Vibar* screen much can be done to maintain a trouble free effluent disposal system.

INTRODUCING EARTHWORMS

Earthworms help to incorporate organic matter, improve soil structure, and increase water infiltration and root penetration. By so doing they can increase pasture production by one third when introduced into soils deficient in them.

Worms can be introduced by cutting turf blocks from a good source area and placing these with lime on a 10 m grid over the deficient pastures. Machines have now been developed by the Institute to perform each of these tasks.

New Zealand Agricultural Engineering Institute, Lincoln College, Canterbury, New Zealand.