NZAEI NEWS

NO. 2 *An informal account of current activities* AUGUST 1976

EDITORIAL

We hope you find the NZAEI newsletter interesting and useful. If you have suggestions on items you would like to see in the newsletter, make them known by contacting:

The Information Officer
NZAEI
Lincoln College
Canterbury

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TRACTOR SAFETY CABS

More work has been done on submissions recommending acceptance of certain overseas safety frame tests. The proposal is that the present British, O.E.C.D., Australian, and U.S.A. tests be accepted as a basis on which a N.Z. certificate of approval may be issued. This will not apply to two post design frames - these must still meet the requirements of the N.Z. Standard.

Some recent tests of frames on light tractors have resulted in a trail of broken castings, so the energy requirement in the N.Z. Standard is being re-examined.

CULTIVATION

Twenty four cultivation plots have been sown in winter wheat, with implements such as the Lely Roterra and Spintiller being compared with more traditional methods. Emergence and speed of growth varied between plots, with the direct drill (that is, no cultivation) method showing first emergence and fastest growth.

The Lely Roterra and Duncan Seedliner in combination (using the NZAEI bridge link) worked well in a cultivation trial on Algerian oats, showing savings in time and fuel use.

FODDER BEET

We reported in the last 'NZAEI News' that harvesting was more difficult with the Dutch monogerm varieties. We should add this time that they show greater dry matter yields than Yellow Daeno, by about 50 per cent,in our trials. See article on page 4.

BALE HANDLING

The Midwest Unbaler (USA), a prototype unwinder from Andrews and Beavan, and a locally made unwinder from Taylor Industries have been examined over the last few months. These machines, for feeding out the large round bale, all operated satisfactorily, but gave a swath more suited to cattle than sheep. We do not know of any machine that can tease out a round bale into the long and sufficiently thin swath more suitable for sheep.

FRUIT HARVESTING

The NZAEI raspberry harvester is being modified to reduce noise

and vibration, and improve sorting. Using the harvester on boysenberries trained on the canopy system results in a lot of berries being punctured, so further mechanised harvesting studies will be concentrated on the thornless form of boysenberry (youngberry).

A new profile sprayer for both apples and raspberries is being built as a result of the success with an improvised rig used last year.

AERIAL SPRAYING

A number of replies to overseas enquiries on droplet sizing and tracer techniques have been received, and an order for some fluorescent particle tracer has been placed in the U.S.A. Two rotary atomisers, which may be useful for producing uniformly sized droplets, have been delivered by Max Webb on his return from the U.K. A rig for testing atomiser performance is almost complete.

FENCING

The first five production prototypes of the *Mate Tyawire* fencing batten machine are now being assembled.

The ungalvanised line wire samples installed in the Rotorua durability trial failed due to corrosion after only two and a half years. They have been replaced with Australian and Japanese 2.5 mm H.T. and English 4.0 mm high copper content galvanised line wires.

Testing various post and wire spacings continues at the stock holding trials, with the test sheep continuing to penetrate these early combinations as expected.

EROSION

Computer processing of North and South Island surface wind analyses for wind 'erosiveness' has taken longer than expected, but is giving more promising results than anticipated. Extension of estimates of long term erosiveness from 30 sites (with hourly wind records) to the much more numerous sites with daily wind run records only should be possible.

Demonstration of cultivation practices, and some further work on surface soil moisture, will be carried out on two half hectare plots on the Lincoln College research farm this summer.

IRRIGATION

Further design and testing work has been done on the two moving sprayline projects, with a view to having working prototypes late this comming summer.

In *NZAEI News No. 1* we reported that Peter Carran of the Institute, Laurie Weston (MAF) and Errol Hewett (DSIR) were to examine the reasons for inadequate frost protection by some recently installed systems. The main problem with some installations examined in Central Otago was the failure to follow existing design recommendations, apparently because both growers and contractors did not appreciate the reasons for the recommendations, or the consequences of ignoring them. An extension programme has been undertaken by the local Farm Advisory Officers (Ag.Eng). The ESDUC computer program, which produces contour plans of the distribution of water resulting from any given system, is very helpful in this as it allows the effects of poor design to be presented in a way readily

understood by growers and contractors.

Glenmark Scheme - The final report is nearly complete. It will be in four volumes:

1 Summary and Recommendations
2 Technical Appendices
3 Farm Budgets
4 Folio of Plans

WATER RESOURCES

Computer modelling for simulating various water allocation alternatives will be carried out by the Institute as part of the North Canterbury Catchment Board's Hurunui River study.

Vince Bidwell and Terry Heiler have talked with MWD Soil and Water engineers about a programme to investigate improved flood estimation procedures in N.Z.

DRAINAGE

Professor Glenn Schwab's recommendations for research have been included, where appropriate, in an Institute statement on drainage research. Proposed work on drainage has been divided into three areas; (a) extension activities, (b) the assessment of various drainage theories of a mathematical nature which may be suitable for local application, and (c) applied drainage work on the College Dairy Farm.

WASTE MANAGEMENT

Ground water monitoring bores have been driven, and sampling, in co-operation with the College Microbiology Department, has commenced at the local dairy farm referred to in the last *NZAEI News*. Monitoring for pond performance will start when a relatively steady state has been reached.

Institute staff are also monitoring water quality changes in a stream flowing through the College Dairy Farm. The effects of both surface runoff and subsurface drainage from a paddock receiving dairy shed effluent is the main interest.

Work on surface aerator treatment has recommenced. The performance characteristics of the "Pos 2" and "Simplex" type aerators are currently being examined, using water.

HERE AND THERE

•The Institute's testing programme over the last three months has included four safety frame tests, a test on an aerial solids distributor for Whirlwide Helicopters, and performance testing of a new, locally made irrigation sprinkler.

•In an action for damages brought by a vineyard against an aerial operator spraying herbicides the Institute was approached by counsel for the defence. The spraying had taken place eight kilometres from the vineyard, and, after thoroughly examining all relevant evidence, we believe that the operator was not responsible. However, the case was settled out of court on a technicality.

•Mike Watson, Deputy Director, spent two weeks in Australia recently advising on the establishment of an Agricultural Engineering Institute in Victoria.

•John Dunn, Keith Humphries, and John Maber were judges at the National Field Days at Hamilton in June.

•Peter Carran presented a paper on *Catch-can Efficiency*,

and Vince Bidwell gave one entitled *A new look at agricultural drainage in New Zealand* at the M.A.F. Agric. Engineering Conference in August.

•Graham Garden spoke on aerial spraying at the Weed and Pest Control Society's annual conference.

MONOGERM FODDER BEET IN NEW ZEALAND

During the 1974-75 season a Canterbury stock firm imported a small quantity of genetic monogerm fodder beet seed from Holland. Two varieties, Mono Blanc and Mono Rosa, were involved and they were both supplied in pelleted form. Excellent crops were produced at Willowbridge and considerable interest was created.

To compare the new varieties with the traditional New Zealand multigerm variety, Yellow Daeno, the NZAEI put in a fully mechanised trial on the College Stud Farm this past season. Drilling was delayed six weeks because of water logged soil but the seed eventually went in on 17 October. The herbicide Venzar was incorporated with a Dutch harrow prior to drilling and no further weed control measures were required.

Fresh weight yields when harvested in June showed similar results for Yellow Daeno and Mono Blanc with Mona Rosa some distance behind. However when dry matter content of the three varieties was considered the superiority of the new varieties was evident. Total dry matter yield of roots and tops was some 40 per cent greater than Yellow Daeno.

However this is not the whole story. The roots of both monogerms grew deeper in the ground and were more difficult to harvest. The nudger plate snare of the NZAEI harvester left more roots behind with both varieties than with Yellow Daeno. Losses following a self-help *in situ* grazing system could also be expected to be higher.

The new varieties should be welcomed by the N.Z. market particularly as their monogerm characteristic is coupled with a considerable lift in dry matter yield. But potential growers should be made aware that some extra effort may be required to harvest the deeper growing roots.

A comparison of multigerm and monogerm fodder beet varieties

	Variety		
	Mono Rosa	Mono Blanc	Yellow Deano
Seed: stated germination %	91	89	76
field germination %	70	79	70
Nominal seed spacing at drilling	210 mm(8⅜in)	210 mm(8⅜in)	190 mm(7½in)
Seedlings/seed following emergence: singles %	69	78	46
doubles %	1	1	21
multiples %	0	0	3
misses %	30	21	30
Singles as a % of seeds emerging	98.6	98.7	65.7
Final plant population/ha	40 300	53 820	57 200
Yield roots, fresh weight kg/ha	51`621	82 065	81 006
Yield tops, fresh weight kg/ha	31 767	21 840	15 883
Total yield, fresh weight kg/ha	83 388	103 905	96 889
Dry matter - roots %	21.3	19.2	14.4
Dry matter yield, roots kg/ha	17 761	19 949	13 952
*Dry matter yield, tops kg/ha	6 352	4 368	3 176
Total yield dry matter kg/ha	24 113	24 317	17 128
Dry matter yield % Yellow Daeno	140.8	142.0	100

* Dry matter of tops, all varieties, assumed to be 20%

RECENT PUBLICATIONS

Test Report T58 - Liquid Manure Pumps. (10 c)

Internal Report No.79 - A Comparison of Fodder Beet Varieties. (50 c)

PAPERS BY NZAEI STAFF

Dunn, J.S. *A new slant on mechanical harvesting.* American Fruit Grower 96(6), June 1976.

NOTE: Copies of most NZAEI publications may be obtained from the Information Officer, although the circulation of some Internal Reports may be restricted.