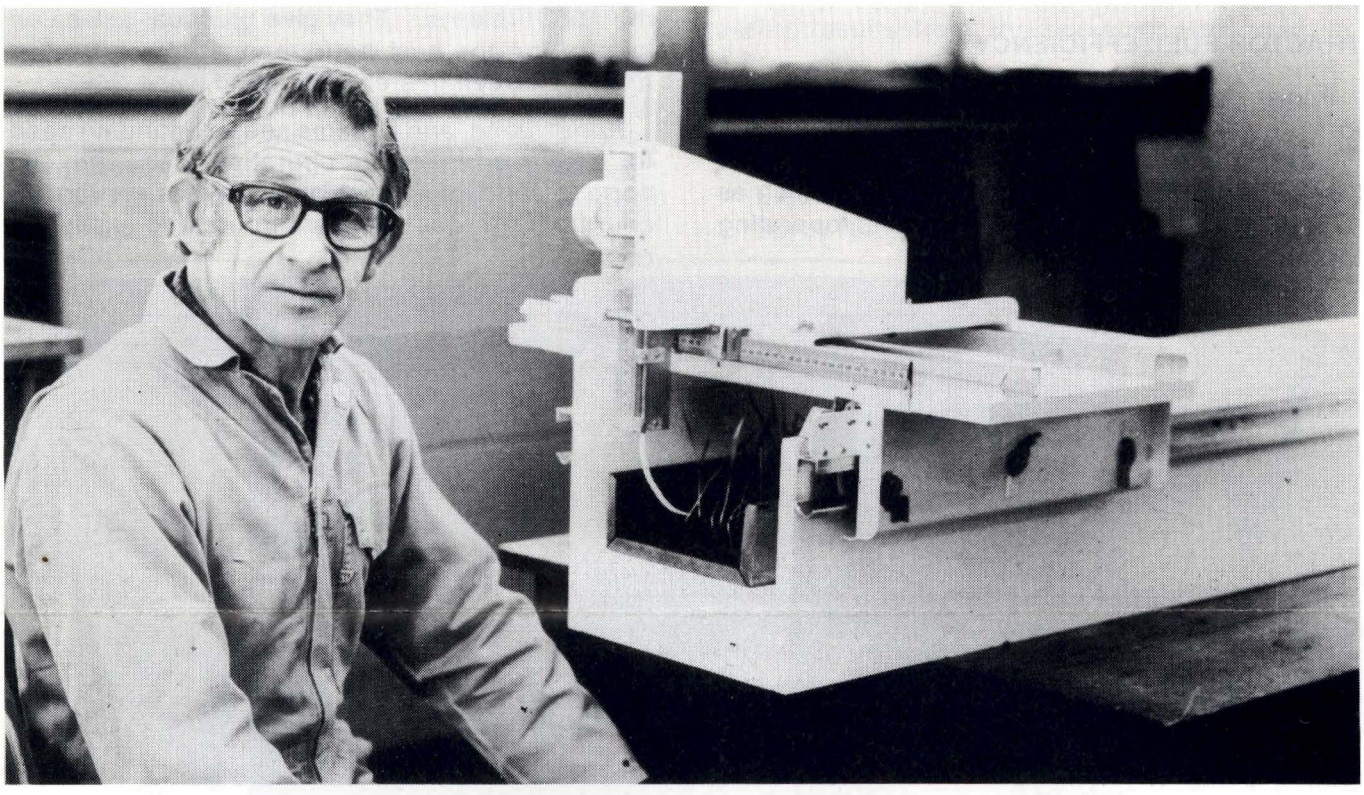
New Zealand Agricultural Engineering Institute

news

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Lincoln College, Canterbury, New Zealand.

When All Else Fails – Ask Rex Gibbs



Many people around the Institute have learned they can save themselves a lot of work and worry by seeking Rex Gibbs' advice before they begin a job involving metal and machinery.

Rex is a technical officer who has worked with the Institute for 17 years. He is a quiet but cheerful character who gets the tricky assignments requiring inventiveness, infinite patience, and a profound knowledge of precision workshop practice. Anything Rex makes is a mechanical masterpiece - and you can be sure there's nothing remotely like it in the whole world.

His latest creation is a 3D measuring apparatus designed to plot seed placement in the soil by direct drilling machines.

Immediately after experimental areas have been direct drilled, sample blocks of turf are dug out, taken to a glasshouse and germinated. When the seeds have sprouted, each piece of turf is put in Rex's 3D measuring machine.

The emerging seedlings serve as flags to indicate where each seed is in the soil, and the earth is carefully scraped away until the seed is located. The mobile pointer needle is then moved to touch the seed and its precise position and depth can be read and recorded.

It takes 10 to 30 minutes to locate and measure the seed in each sample block of turf, depending on the soil and quantity of seed sown. About 10 - 15 blocks of turf are enough to show the average seed pattern for each drilling machine tested.

The new 3D seedling measuring machine counts only the seeds that germinate and emerge, and it is proving to be an efficient and useful appliance.

The new machine will be used frequently during this year's drilling trials in the Otago and Canterbury high country.

Three drills will be used in the trials, the NZAEI Roto-Drill, a commercial triple disc drill, and a Hunter Strip Seeder imported from the U.K..

This machine was first developed by the Scottish Institute of Agricultural Engineering. It has independent sets of floating rotors very similar to the NZAEI design. Technical Officer Russell Horrell has been corresponding with the Scottish Institute for five years and arranged for the importation of one of the new machines as soon as it became available.

Extension

Although much of the Institute's work involves research and the development of new equipment, it can help the farming industry to save millions of dollars simply by demonstrating efficient operating methods. Current extension programmes concern tractor fuel efficiency, electric fencing, and sprayer operation.

TRACTOR FUEL EFFICIENCY

Roger Young, John Milne, and Graeme Martin form the Institute's tractor team. At the Y.F.C. Fieldays they demonstrated that many farmers can reduce their diesel fuel costs by as much as 40% just by simple, common-sense, operating techniques.

They showed how a tractor can burn 15% less fuel if the driver uses higher gears and lower engine speeds. He can save a further 20% by using the tractor's draft control for cultivation implements instead of depth wheels.

Simple hints like these can mean that many farmers could cut their fuel bill substantially with very little effort. About $80 million was spent on agricultural diesel fuel last year, so the potential savings amount to millions.

The tractor team compiled a set of easy-to-follow information notes entitled "Tractor Factors" for the 1982 Fieldays. They give practical advice on how to get the best performance from a tractor, and have been in steady demand since.

Roger, John, and Graeme see a continuing need for education in tractor operating skills, and they hope to conduct more demonstrations around the country if there is sufficient interest to justify the cost.



The Institute's display at the 1983 National Fieldays at Mystery Creek

THE NATIONAL FIELDAYS DISPLAY - by Graham Garden

We chose electric fencing as the topic for the Institute's display at the 1983 Fieldays held at Mystery Creek near Hamilton. Unlike previous years, we decided to present the information in a series of short talks supported by a static display and printed handouts.

We gave these talks three times on each of the three days. They were entitled, "Designing for Minimum Voltage Loss", "Installing Adequate Earthing", "Selecting Insulators", and "Choosing an Energiser."

In the display we promoted the use of improved grades of plastic for insulators, a stronger aluminium wire for leadouts, and a different technique for testing the earth installation.

The display will be presented at the A. & P. Show at Christchurch in November. Plans are also being made for the Institute to hold one-day "workshops" on electric fencing.

The printed handouts for the Fieldays were a set of advisory notes entitled "Electric Fencing". They contained 32 pages of information on electric fencing equipment, materials, and recommended design and maintenance practices.

Spraying Instruction Courses

Last year $83 million worth of agricultural chemicals was used in New Zealand - and much of it was wasted. According to Lincoln's "Mr Spraying", Trevor Pratt, a recent survey indicated that two out of every three operators make significant errors when spraying crops.

Poorly tuned equipment, incorrect mixing, and failure to follow instructions can cost farmers up to $30 per hectare, and must be wasting millions of dollars nationwide.

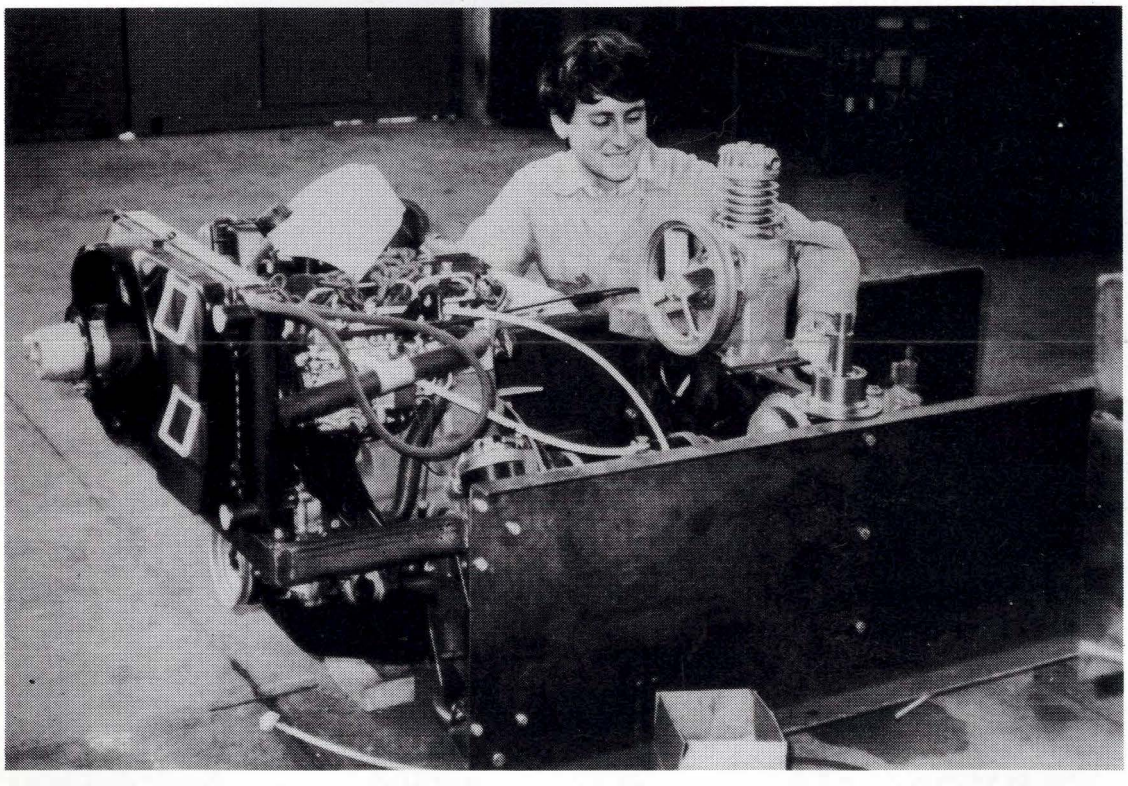
People often buy expensive new equipment expecting a reduction in the cost of the chemical they use. Trevor believes many of them could have made substantial savings with their old sprayer by better maintenance and operating practices.

Trevor has organised a series of courses for boom sprayer operators in eight locations from Gore in Southland to Hamilton in the Waikato. The sessions will be conducted by Institute staff and Mr John Harden of the Plant Protection Division of the Queensland Agricultural College.

From information supplied by people who have enrolled for the courses, it appears that an average farmer could be spending somewhere about $10,000 each year on agricultural chemicals. Trevor thinks farmers who attend the courses could save 5% - 10% by using their spraying equipment more efficiently, and get better results from the spraying work they do.

The three sets of advisory notes are available, or soon will be. Prices include postage.

"Tractor Factors" 23 pages	$3.00
"Electric Fencing" 32 pages	$5.00
"Spray Notes" 60 pages approx. (still in print)	



Stephen Anderson, one of the Institute's workshop team, and the "engine room" of the new apple harvester

Apple Harvesting

Over recent months the best-selling Institute publication has been "Apple Production for Mechanised Harvesting on the Lincoln Canopy System" by John Dunn and Martyn Stolp.

Another revised edition will be going to the printer soon, but the final version will not be written until the last major item of equipment is finished and working satisfactorily.

This is the mechanical harvester, and it is now being built in the Institute's workshops at Lincoln as part of a contract with the New Zealand Apple and Pear Marketing Board.

Chief designer, Dick Harwood isn't giving much away about his new machine, but we understand it has a 30kw engine and will weigh about two tonnes.

Two other experimental machines were built and used in trials in 1977 and 1980. Neither of these was as adept at removing canopy-trained apples as John Dunn's wooden "whacking stick". Still smarting from those experiences, our design team is determined technology will win out this time, but we notice John's stick is ready for action, leaning against the wall in the corner of his office.

Sunset on Beet?

A report on the Beet/Ethanol Project by Dr Vince Bidwell.



"As the sun sinks slowly in the west, the Institute's harvesting machines bring in the last of the 1983 beet crop.

Early August marked the last of the 1983 beet harvested for the ethanol research plant. The plant will operate on stored beet until early December this year and then close down.

The Institute will have been involved in research into the harvesting, transport, storage, and processing of beet for alcohol fuel since September 1979. This four year programme has been funded by the Liquid Fuels Trust Board but has also involved a heavy commitment of Institute resources.

Is there a future for a beet/ethanol industry in New Zealand?

Studies of economics of producing a transport fuel from beet indicate that in the face of the cost of oil imports and the difficulties of marketing our agricultural produce it would be worth serious consideration. However the present commitment to exploiting our natural gas resources probably means that beet ethanol will not be developed in the immediate future.

Beet sugar is still a more profitable product from beet farming than fuel alcohol, but the domestic market (or part thereof assuming imports from Fiji), is smaller than for motor fuel. This would support one factory and involve about 500 farmers.

Equipment Disposal

With the completion of the beet harvesting work, Lincoln College will be calling for tenders early in 1984 for the disposal of the equipment on behalf of the Liquid Fuels Trust Board. Initial expressions of interest in the harvesting machinery can be directed to Dr. V.J. Bidwell of the Institute.

Future Bio-technical Research

During the course of the beet ethanol research the Institute has built up staff and equipment resources in the area of bio-technical research such as fermentation, waste management, agricultural product processing. The research plant itself which has shared ownership by Lincoln College and Liquid Fuels Trust Board will be retained intact for at least another year. The Institute is actively seeking new areas of research which could make use of these resources to contribute to our primary industry. It is expected that new work would mainly be funded on a contract basis.

Request for further information should be addressed to:

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CANTERBURY