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CHEMICAL SPRAY PROTECTION



Protective cab mounted on the front of a tractor for use in orchards. The cab was designed and constructed by NZAEI staff at Rukuhia.

An investigation into chemical spray protection has begun at the Institute's Rukuhia sub-station.

The project sets out:

* To evaluate pesticide concentrations at operator level so that protective equipment requirements can be determined.

* To conduct laboratory tests with the test cab and determine the pressure and flow rate of clean air needed to prevent entry of spray.

In conjunction with the Ruakura Agricultural Centre, preliminary trials have been run in developing a system for measuring pesticides in the air.

A glass wool dust filter has been incorporated in the air sampler to estimate the droplet to vapour percentage.

Three types of organophosphate sprays - phosmet, chlorpyrifos and dichlorvos - were used initially. They are of varying volatility and the results were consistent and repeatable.

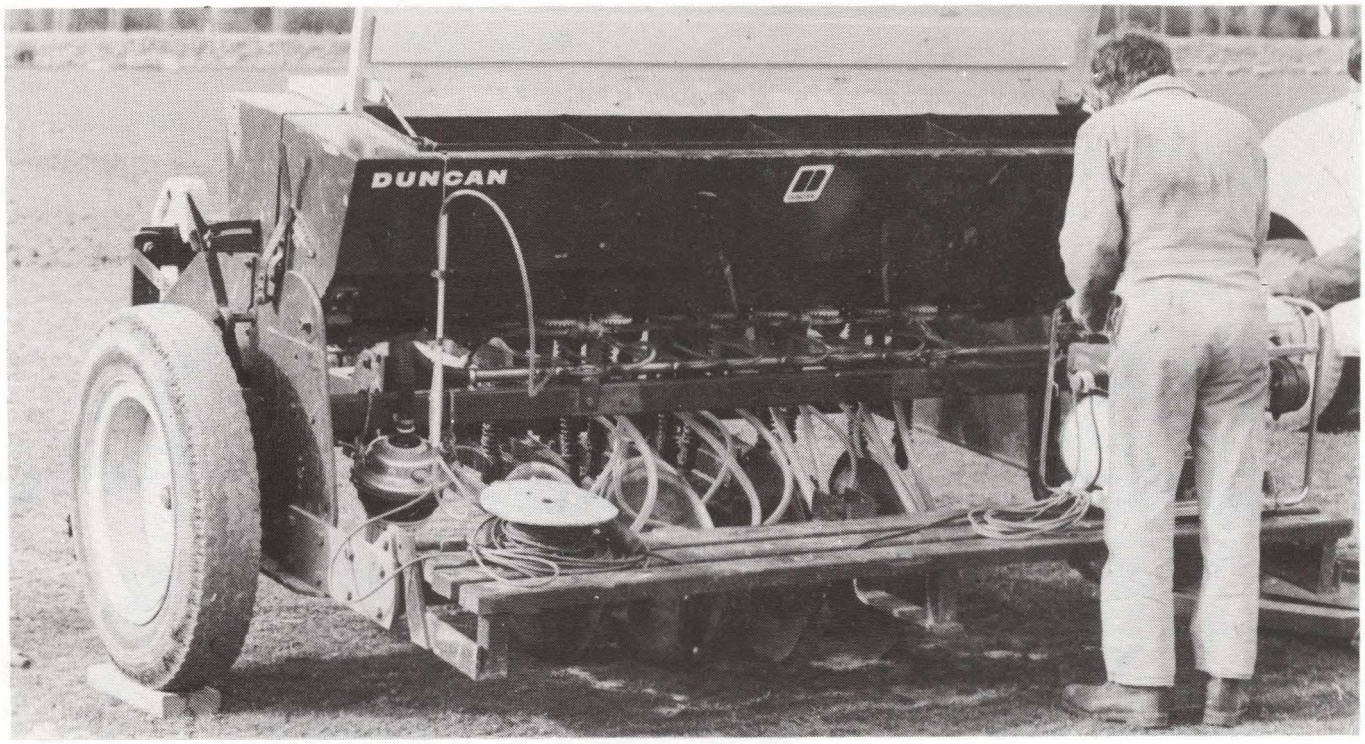
The low vapour pressure sprays were collected almost entirely as droplets on the glass wool dust filter while the high vapour pressure sprays passed through the dust filter and collected entirely in the impingers as a vapour.

The enclosed cab, specially designed for orchard spraying, has a filtered air supply and is mounted on the front of a tractor. Visibility is acceptable, although the cab may have to be lowered even further for kiwifruit spraying.

Calibration of the test cab began with determining pressure versus flow rates for various degrees of sealing. A vent was built into the cab to allow the amount of sealing to be altered.

Experiments have been conducted to find the required pressure to prevent spray entering the cab. The cab was placed inside a smoke filled tent, and clean air forced at varying pressures into the cab.

DIRECT DRILLING TRIALS



Experimental drill with blower for air assisted conveyance of seed and fertilizer

Field trials in the direct drilling of crops have been carried out in a joint project with the Ministry of Agriculture and Fisheries.

Eight coulter types have been used in the trials which took place near Ashburton.

Three of the machines being developed by the Institute are:

* A Newcastle coulter which consists of a large concave disc with attachments for trash handling and depth control.

* The Roto-drill, a modified rotary cultivator which cuts slots in the ground. Seed and fertilizer are fed into the slots directly behind the rotor blades.

* An A-blade coulter which sows two lines of seed, with both seed and fertilizer delivery air assisted

Crops were sown in September under good field conditions with all machines performing well.

However, substantial differences were apparent in the three-week emergence counts. Percentage emergence counts were:

Rotodrill 75; multiseeder with hoe coulter 71; full cultivation 71; KKK tine coulter 69; Cocks coulter (farmer) 69; Newcaster coulter (single disc) 56; multiseeder triple disc 47; Scottish I.A.E. A-blade 26.

Wheat trials at Gore, using the Roto-drill, triple disc, Aitchison 2000 and KKK tine, were sown in mid-October and have shown no difference in three-week counts.

The Roto-drill was also taken to Rotorua for regrassing trials of run-out pasture in association with the M.A.F. Research Division.

PROGRESS AT HAKATARAMEA

Forty farmers have expressed firm interest in the Institute proposals for irrigation development in the Hakataramea Valley in North Otago.

Sample farm investigations of the engineering and economic problems have yielded results sufficiently encouraging for further field work to be carried out on the remaining 35 farms.

Eight streamflow monitoring stations have been set up in the valley as part of the overall water resources investigation involved in the study.

Reconnaisance mapping of construction materials for storage works has been completed and soil samples taken for laboratory analysis.

This work has involved staff from the Institute, M.A.F., Soil Bureau and the Tussock Grasslands and Mountain Lands Institute.

THE ROTODRILL GOES COMMERCIAL



The Roto-drill slot seeding high-producing grasses into poor native tussock land

Mr Richard Speight, of Wether Hills, Ohai, has bought the first commercial release of the Roto-drill developed by the Institute at Lincoln.

His decision to buy the Roto-drill followed a 16 hectare trial at Wether Hills by NZAEI researcher Mr Russell Horrell.

Mr Speight has about 800 hectares of tussock country at altitudes between 330 and 600 metres which could be rotodrilled. He plans to use his normal oversowing mixture of cocksfoot, ryegrass and white clover.

Manufactured by Henry Engineering Ltd of Loburn, the Roto-drill is a modified Gallagher Dreadnought rotary hoe with an 80-inch Connor Shea seedbox.

Mr Newton Henry says the machine is now commercially available and he provides setting-up and back-up service.

The Roto-drill was born through the dissatisfaction of a Palmerston farmer, Mr Leighton Coutts, with the effectiveness of existing overdrilling machinery on his upland tussock and browntop country in North Otago.

Mr Coutts modified a Howard rotary hoe and added a seed and fertiliser box so that seed dropped into cultivated strips about 10 cm wide at 25 cm centres.

His work with this machine over several years convinced Mr Coutts he was getting good value for money.

In 1977, his machine was lent to the NZAEI for trials in other areas.

These trials showed the machine was much superior to surface broadcasting on rocky, exposed ground and to a single-disc drill on level ground.

The NZAEI team then set about producing its own machine. A Howard seedavator was modified, and two new coulter types were made.

One was a rigid tube through the back plate of the hoe; the other a tube attached to a double-disc opener.

Tests proved them about equal in efficiency, but the tube coulter is the cheaper. The addition of a press wheel to consolidate the soil in the slot has improved establishment in dry, fluffy soils.

The trials have shown that the Roto-drill often performs better than tine and disc drills, particularly in drier conditions.

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