

## 7. End-of-life tyres

### 7.1 Introduction

End of life (EOL) tyres are a common sight on silage pits in the region and provide a good disposal outlet for tyre dealers and garages. They have traditionally been used as weights on silage pits, but this has also expanded to retaining walls and culvert reinforcement. A farm may have a few hundred or up to several thousand end-of-life tyres depending on farm size, herd size and number of silage pits. While not an immediate waste of concern on farms in the region they can be damaging to the environment if burned. However, the reuse factor combined with the long life of tyres if used for pit weight means there are many positives of EOL tyres on farms.

### 7.2 Information sought

There was a good response to this section with only two farmers not responding. The participants were asked if they had brought EOL tyres onto the farm in the past five years, what type, how many and what they were used for. The quantity of EOL tyres generated on farms was determined to be very low, approximately one per year, and therefore was of very little importance.

### 7.3 Results

Details of types brought onto farms, quantity, price paid, if any, and sources of EOL tyres are shown in Table 23, Table 24, and Table 25. 32% of those surveyed had brought an average of 416 EOL tyres onto their farms in the past five years. 38% of these farmers stated that they did not pay for the EOL tyres while 38% paid between \$0.60 and \$1.50 per tyre, and the final 24% were unsure if they were charged or not. In general, those that did not pay for their tyres picked them up from local garages or tyre dealerships, thus avoiding the cartage cost, while delivered EOL tyres typically cost \$1.00 each.

**Table 23** Tyres brought onto farm during the last 5 years (n=90)

	Yes	No	No response	Average no. tyres bought onto farm in last 5 years
Were tyres bought onto farm in last 5 years?	29 [32]	59 [66]	2 [2]	416

Key: numbers in [ ] are percent

**Table 24** Price paid per tyre (n=29)

	\$0	\$0.6	\$1.00	\$1.50	Unsure
Price per tyre	11	1	7	3	7

**Table 25** Mode of obtaining tyres (n=29)

	Picked up	Delivered
Mode of obtaining tyres	11 [38]	18 [62]

Key: numbers in [ ] are percent



**Photo 5** Tyres reused as silage cover weight

## 7.4 National and Taranaki data

A telephone survey was carried out by the Taranaki Regional Council in December 2003 in order to determine the quantity and disposal routes for EOL tyres in the region and any problems that may exist. Twenty one businesses (including tyre dealerships and garages sourced from the yellow pages) were surveyed.

The overall situation was that most businesses had a reasonably steady, if not slightly increasing, business growth leading to a general increase in the number of EOL tyres. In terms of disposing of these tyres, almost all businesses gave their tyres away to farmers (and to a lesser extent gardeners, builders and wharf users) for use as weights on silage stacks and to the public for the building of retaining walls or culverts. The amount of time the tyres spent in storage on-site at a business was seasonal, where in the summer the high demand from farmers kept storage time down.

When asked if the company employed or knew of any disposal operator the general response was that there was no current requirement for one. Fields Transport were mentioned a number of times as they run an operation where they pick-up, store and then deliver tyres to farmers, for a cartage fee. In terms of a recycling scheme some businesses had heard of companies from larger cities who in the past did this, although knew very little about them and were not sure if they even continued to do so. Around three dealers had been approached by an unknown person/s

wanting to take the tyres, at cost to the dealership, in order to then sell them on to farmers. No dealerships availed of this offer.

Beaurepaires dealers stated their company was having, or beginning to have a recycling system put in place in Auckland because tyre disposal in Auckland is a problem due to limited environmentally friendly, disposal options. However, Beaurepaires in Taranaki are not using this system as they would incur a significant disposal cost increase.

Based on estimates made by the businesses during the survey, an estimated figure of 70,000 EOL tyres per year are being produced in the Taranaki Region. These tyres are coming from 38,502 motor vehicle base in Taranaki for households in private occupied dwellings (not including off-road vehicles), as obtained from the 2001 census ([www.stats.govt.nz](http://www.stats.govt.nz)).

No tyres were being shredded by the dealerships/garages and all but two were not having to dispose of the tyres themselves (having farmers or transporters pick them up). All but one business did not charge the farmers for the old tyres, most stating they were just happy to get rid of them.

### **Tyre Track**

Recently a voluntary system named Tyre Track was launched in New Zealand. Tyre Track is a national system to make sure that all old tyres are managed responsibly.

It uses an online database ([www.tyretrack.co.nz](http://www.tyretrack.co.nz)), and the 0508 TYRE TRACK (0508 897 387) freephone number, to link disposers of old tyres with transporters and end users. Tyre Track connects tyre dealers, and others who need to dispose of old tyres, with registered tyre transporters and registered disposal points, such as recyclers, processors, landfills, farmers, marinas, and speedways. Users of Tyre Track (both generators and users) have to register to use this system.

The Motor Trade Association is operating Tyre Track on behalf of the tyre industry. Tyre Track is strongly supported by the Ministry for the Environment. The Imported Motor Vehicle Dealers Association, the Motor Industry Association local and regional councils and the Automobile Association are among the organisations that have worked to set up Tyre Track.

Tyre Track will monitor tyre deliveries to make sure they go to the right place. Dealers and the public will have confidence that their old tyres are being managed responsibly.

## **7.5 Discussion**

Approximately one third of those surveyed had brought EOL tyres onto the farm in the past 5 years. This equates to 1,000 farms of the approximate 3,000 farms in the region. The average number of EOL tyres brought onto the farm was 416 which were predominantly car, ute and ATV type. (Tractor and lorry tyres are too heavy and awkward to handle). Regionally this would mean over 400,000 EOL tyres are disposed of to farms every five years or approximately 80,000 per year. This is very close to the estimated 75,000 generated within the region each year as determined by the telephone survey. A workshop carried out by the TRC in 2004 with tyre

dealers and garage owners in the region, concluded that farmers were still absorbing most if not all EOL tyres in the region.

Farmers that pick up EOL tyres from the local garage or dealership usually got them for free, as the cartage cost was covered by the farmers. This accounted for 38% of those that had brought EOL tyres on to their farm in the past 5 years. The remaining 62% paid prices ranging from \$0.60, \$1.00 and \$1.50 of which \$1.00 was most common (24%), to have the EOL tyres delivered to the farm. Of the 29 farmers that brought EOL tyres onto farms, 7 (24%) stated that the tyres came from the Auckland region. This indicates that approximately 20,000 annually are from the Auckland and Hamilton areas. While 20,000 may seem a lot it only equates to 48 farms taking the average 416 EOL tyres. It is likely that a delivery from Auckland to a farm in Taranaki would be above that average quantity.

It should be noted that of those surveyed 38 farmers made silage and 29 stated that they had brought EOL tyres onto their farm in the past five years. It is reasonable to assume that most if not all 29 farmers used the tyres for weights on silage pits. If so, then approximately 76% of silage making farmers brought EOL tyres onto their farms in the past five years.

This may mean that all silage farmers will take EOL tyres in a 6.5 year cycle, which may be a useful yardstick. However, EOL tyres have a long period of usefulness on farms, probably 20 years or more, which leaves unanswered the question of what is happening all the tyres that end up on farms. There are always civil works being carried out on farms and they are certainly used for this whenever possible. It is realistic to consider that a percentage is burned. It should be noted that the TRC get very few complaints about smoke from tyre burning. The Regional Air Quality for Taranaki prohibits the burning of tyres.

It is difficult to see 1 million tyres going to farms in the Taranaki region in 13.3 years and not reaching saturation point or at least encountering a marked slowdown in uptake by farmers. Add to this the recent drop off in maize silage production and the continued growth of bale silage produced. However, the fact remains that tyres are not spilling out around the region and visibly do not seem to be building up on farms.

## **7.6 Future disposal options**

Encouraging farmers to take and reuse EOL tyres on their farms is in keeping with the waste management hierarchy. EOL tyres are therefore a waste problem for very few farmers – only those that have tyres but do not make pit silage. Farmers in this situation could either advertise their tyres for sale or free collection in their local news paper, or contact their local livestock transporter and offer the tyres to them.

There is also the opportunity to promote the responsible disposal of EOL tyres and the use of Tyre Track wherever appropriate.

## 8. Waste metal

### 8.1 Introduction

The quantity of waste metal generated annually on farms is reasonably small. Items such as waste wire, electric fence rods, hay rake tynes, and mower blades are generated each year on farms. The impact of these waste metals is visual but there is also the potential to rust and leach into water courses.

Large items such as end-of-life tractors, trucks, diggers and cars are reasonably common on farms but their quantities per farm are low and infrequently generated. Waste associated with vehicles includes engine and hydraulic oil, batteries, heavy metals, air conditioning gases and radiator fluid.

Although waste metals, and in particular vehicles, have the potential to pollute the environment they are also a recyclable resource which is worth considering when discussing waste metal on farms.

### 8.2 Information sought

Farmers were asked if they generated waste metal each year and if so what were the sources and types of this waste metal, how much was produced and how it is disposed. The type and quantity of end-of-life vehicles on farms was also recorded.

### 8.3 Results

There was a very good response to this section of the questionnaire. Of the 90 farmers surveyed 88 stated that they generated some quantity of waste metal each year. Only two farmers stated that they did not generate waste metal on their farm due to the fact that these farms were small and treated as run-off properties more than farms proper. The two farmers were close to semi retired and involved only in dairy grazing. Table 26, Table 27, Table 28, and Table 29 show information gathered with regard to waste metal on farms.

**Table 26** Generation of waste metal generated on farms each year (n=90)

	Yes	No
Waste metal generated on farm per year	88 [98]	2 [2]

Key: numbers in [ ] are percent

95% stated they generated some waste metal from various activities on the farm including hay and silage making, fencing, and construction. 17% stated they had one or more full motor vehicles on the farm. A profile of these vehicles is shown in Table 28.

**Table 27** Source of waste/unwanted metal (n=88)

	Motor vehicle	Motor vehicle parts	Other*
Sources of waste metal	15 [17]	1 [1]	84 [95]

Key: numbers in [ ] are percent

\* such as hay rake tyne, wire, mower blades etc.

**Table 28** Type of waste motor vehicle and average per farm (n=15)

	Truck	Tractor	Car	Ute
Numbers of farms with	4	1	13	2
Average EOL vehicles per farm	1.0	1.0	1.9	1.0

The principal method of waste disposal on farms was by burial which includes disposing of vehicles to gulleys. 59% of farmers stated that they buried some or all of their waste metal. 12% of farmers stated that they disposed of metal to a skip/wheelie bin and 5% brought it to a landfill. Only 14% stated that they recycled some or all of this waste, which is disappointing considering that the material is easily recycled in New Zealand.

**Table 29** Method of disposal of waste metal (n=88)

	Bury	Stock pile	Recycle	Skip/ wheelie bin	Landfill
Waste metal	52 [59]	9 [10]	12 [14]	10 [12]	4 [5]

Key: numbers in [ ] are percent

Nine farmers (10%) were stockpiling their waste metal in hope that a scrap dealer would collect the material. Photo 6 shows a typical pile of unwanted fencing post and wire for disposal.

**Photo 6** Wire tangled with fencing post and vegetation for disposal

## 8.4 Discussion

Of the 90 farms surveyed 98% stated that they generated some quantity of waste metal on the farm each year. The predominant type generated annually on farms was fencing wire, small metal items such as mower blades, hay rake tynes, and electric fence rods. 95% of farmers surveyed stated they generated this type of waste. 15 farmers (17% of those surveyed) stated that they had scrap motor vehicles on the farm. Of these 15 farms 13 (14% of the total surveyed) had one or more cars on their farm (the average scrap car per farm of these 15 farms was 1.9 cars). Two (2%) had scrap utes and 4 (4%) had a truck (see Table 28).

While the sample is small (14 out of 90), 14% of farmers in the region with 1.9 scrap cars per farm equates to an estimated 420 scrap cars on farms in Taranaki. That amounts to approximately 315 tonnes (750kg/car) on farms in the region, of material that is readily recyclable in New Zealand (excluding other waste metal). However, as shown in Table 29 only 14% of farmers carry out some recycling of waste metal, the majority of farmers bury (59%) or disposed to the skip (12%) or landfill (5%). Burying metal may include full motor vehicles, particularly to gulleys. Only 10% stockpile their waste metal. While this stockpiled material has the potential to be taken away and recycled by a scrap dealer it was common to hear farmers say that scrap dealers used to come around regularly but seldom if ever call now. A large number of farmers stated that it had been 3-5 years since they had a call from a scrap dealer. The exception to this was farms on the periphery of New Plymouth who received regular calls from scrap dealers. Discussion with farmers during the survey suggests that farms on the periphery of urban areas are serviced by scrap dealers. Those further away from the urban centres e.g. hill country or upper mountain road, are less likely to be serviced by a scrap dealer or at least receive less frequent visits than those near the urban areas.

## 8.5 Future disposal options

There is opportunity for scrap dealers to work closer with farming and rural community organisations when carrying out scrap collections on farms to publicise the event. Rural organisation could encourage such collections and offer whatever assistance they can to achieve the maximum response.

There is also an opportunity to educate the rural community and promote the separation of waste metal from other waste types and recycle through scrap dealer collections.

## 9. Waste farm batteries

### 9.1 Introduction

There are 600,000 replacement automotive batteries are sold in New Zealand each year. Currently around 500,000 of these are recycled by Exide in New Zealand.

More than 98 per cent of a lead acid batteries can be recycled, making them the most recyclable of any consumer product. New generation lead acid batteries can be made from 100 per cent recycled lead and from up to 90 per cent recycled plastic.

While the number of waste batteries generated on a farm each year is approximately one to two the potential harmful effect of battery acid and the lead contained within justified interest in their disposal route when conducting this survey. Sources of farm batteries include tractor, ute, ATV, motorcycle, digger and electric fences. Traditionally, batteries that were unable to perform in vehicles were used as a power source for electric fences. However, conversations with farmers during the survey indicate that this practice is declining with most electric fences being connected to the grid supply.

### 9.2 Information sought

Farmers were asked to estimate how many waste farm batteries they generated per year and how these were disposed.

### 9.3 Results

A total of 87 farmers responded to this question. As shown in Table 30, 61% of farmers stated that they generated an average of one waste farm battery per year, and a large quantity of these were disposed of off farm (see Table 31).

**Table 30** Number of waste batteries generated on the farm per year (n=87)

	> 2 per year	2 per year	1 per year	1 every 2 years	1 every 3 years
Number of farms	7 [8]	14 [16]	53 [61]	9 [10]	4 [5]

Key: numbers in [ ] are percent

90% of farmers disposed of their waste batteries to their local garage or scrap dealer, 1% dropped them off to the Taranaki Regional Council during hazardous waste collection operations in the region, and 1% dropped them at a transfer station.

**Table 31** Method of disposal of waste farm batteries (n=87)

	Bury	Scrap dealer / garage	TRC collection	Transfer station
Method of disposal	7 [8]	78 [90]	1 [1]	1 [1]

Key: numbers in [ ] are percent

## 9.4 National data

There are 600,000 replacement automotive batteries are sold in New Zealand each year. Currently around 500,000 of these are recycled by Exide in New Zealand ([www.exide.co.nz](http://www.exide.co.nz)).

More than 98 per cent of a lead acid batteries can be recycled, making them the most recyclable of any consumer product. New generation lead acid batteries can be made from 100 per cent recycled lead and from up to 90 per cent recycled plastic.

Exide Technologies currently have an arrangement with Dominion Trading Co of Christchurch to collect and safely deliver scrap batteries to the Exide Technologies Recycling Centre in Petone. In the Centre, the bottom of the scrap battery is cut by a mechanical saw, allowing the sulphuric acid and any lead suspended in the acid to be drained off. The battery is then fed into a hammer mill for crushing.

Once crushed, the remaining components are floated off through a series of flotation ponds. The plastic pieces of the battery case, each by now no larger than a fifty cent coin are re-granulated into plastic which is used to manufacture the next generation of battery cases.

Next, the remaining two components of the scrap battery - lead and lead oxide - are fed into a rotary furnace along with lead dross, sludge and coke and other additives used to assist in the removal of impurities from the lead. This mixture is smelted for about seven hours at temperatures of approximately 500 degrees Celsius.

The molten lead is poured off into a holding kettle and then transferred into refining pots where the final impurities and dross are removed. Lead with a purity of 99.97 per cent is capable of being made, however sometimes, antimony or calcium is added to the lead to make alloys. Various grades of lead alloy are made, depending on the manufacturing end use.

The refined lead is used to manufacture new generation batteries at the Exide Technologies factory nearby in Gracefield, Lower Hutt.

## 9.5 Discussion

Using Table 30 it is reasonable to suggest that approximately 3,500-4,000 waste farm batteries are generated each year in Taranaki. It is encouraging to note that 92% of these are returned to the dealer (90%), given to TRC hazardous waste collection (1%), or disposed to transfer station (1%). 8% of farmers stated they buried their batteries which meant that they were disposed of to the farm waste pit. Taking the estimated quantity of waste batteries generated on farms in the region this equates to approximately 300 batteries (at an estimated 10 kg/battery this is equivalent to 3 tonnes/year) buried in farm pits each year in the region. This is disappointing considering batteries are an easily recycled item.

Some farmers had stockpiled batteries on the farm and intended to bring them to their local mechanic for disposal. The good collection and consequent recycling of farm batteries seems mainly due to the fact that farmers bring the battery to the dealer and check its condition before replacing with a new one. If replaced, the

redundant battery remains at the dealer. Exide have set up a very good battery recycling network in New Zealand which means that garages and scrap metal dealers have a reliable disposal route for these.

## **9.6 Future disposal options**

There is opportunity for further education regarding the proper disposal of spent vehicle batteries. This may encourage farmers to recycle more spent vehicle batteries. If farmers are unsure of where to dispose of their batteries they may wish to contact their local garage, scrap dealer, or Exide Technologies, at 24 Hobson Street, New Plymouth. Most, if not all, will take the battery free of charge.

The Taranaki Regional Council will confirm the requirements under which burial of vehicles batteries is provided for under the Regional Fresh Water Plan for Taranaki.