

**Australian and New Zealand Environment
and Conservation Council**

**Review of Industry Waste Reduction
Scheme for Crop Protection and Animal
Health Product Containers and
*drumMUSTER***

Final report

prepared by McGuffog & Co Pty Ltd
for Environment Australia



Department of the Environment and Heritage

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GLOSSARY OF TERMS

Non-returnable container

In this review the term means a container, or package that is designed for a **single use** only. These containers are also referred to as **single trip** containers. Some examples of non-returnable containers include:

- ?? 20 and 200 litre high density polyethylene plastic and steel drums
- ?? 10, 15 and 20 litre pails
- ?? 5 and 10 litre tins or bottles
- ?? Cardboard cartons
- ?? Plastic and multiwall paper bags

Returnable container

In this review the term refers to a container that is specifically designed for return by the user to the supplier or their retail outlet. The purchaser of the containers is charged a deposit refundable when the container is returned to the supplier or their retailer. These containers are also referred to as **refillable** containers. Some examples of returnable containers include:

- ?? 800 and 1,000 litre plastic or stainless steel Intermediate Bulk Containers
- ?? 1,000 litre minibulk
- ?? 400 litre shuttles
- ?? 100 and 110 litre Envirodrum
- ?? 110L Returnable and Agreturn
- ?? 55L Wombat

Flexible bulk containers

These are used for packaging of powdered or granular products and are usually constructed of a woven plastic outer bag with a plastic film inner bag and usually able to contain up to 1 tonne of material.

The drum re-use program

The program collects and reconditions 20 and 200 litre **non-returnable** plastic drums. This is a privately run commercial program operated by DSL Drum Services Pty Ltd (DSL). Manufacturers and formulators enter into an arrangement with DSL whereby they agree to purchase certain specified product containers that are collected and reconditioned by DSL. The containers are collected by *drumMUSTER* collections as well as through separate arrangements made by DSL with community groups and farm chemical retailers.

There are approximately 30 different herbicide products sold by six Avcare member companies in the program.

The Australian and New Zealand Environment and Conservation Council (ANZECC) National Strategy for the Management of Unwanted Empty Farm Chemical Containers makes specific reference to programs operated by Cycle Drums. This company was acquired by DSL several years ago and continues to operate the above program.

Suspension concentrate

This is a water-based liquid formulation where the active constituent is very finely ground and is mixed with clay-based suspending and thickening agents.

1. EXECUTIVE SUMMARY

BACKGROUND TO THE REVIEW

The Australian and New Zealand Environment and Conservation Council (ANZECC) issued the National Strategy for the Management of Unwanted Empty Farm Chemical Containers at its meeting in December 1997.

In November 1998 the National Farmers Federation, Avcare Limited, the Veterinary Manufacturers and Distributors Association and the Australian Local Government Association entered into an Industry Waste Reduction Scheme Heads of Agreement (IWRS).

drumMUSTER is the national, industry driven program for the collection and recycling of empty, cleaned, non-returnable crop protection and animal health chemical containers. It is a component of IWRS.

drumMUSTER is funded via a levy on the purchase price of crop protection and animal health chemical products sold in recognised non-returnable, rigid plastic and steel containers over 1kg or 1 litre in size. The levy of 4 cents per litre or kilogram commenced in February 1999 and is paid by manufacturers into a fund administered by Agsafe Limited and then passed on to distributors and retailers who in turn pass the levy on to consumers. The Australian Competition and Consumer Commission has approved these arrangements.

The IWRS has two main objectives:

- (i) to reduce the number of containers entering the distribution stream through the setting of industry targets aimed at encouraging manufacturers to adopt alternative packaging containers, technology and/or formulations; and
- (ii) to ensure non-returnable containers have a defined route for disposal that is socially, economically and environmentally acceptable.

In July 1999, ANZECC requested Environment Australia, in consultation with the States and Territories, to conduct an initial review of the IWRS to establish whether it is achieving the implementation of the ANZECC strategy in a timely and effective manner. The review is to be considered by ANZECC in December 2000.

This review examines progress toward the objectives and goals of the IWRS and how the *drumMUSTER* program has managed the disposal and recycling of crop protection and animal health containers to date.

The review has been conducted using data from several sources. Avcare has provided information on container usage by the industry from 1991 to 1999 and on changes in formulation technology over the same period. Agsafe Limited (who administer the *drumMUSTER* program) has provided data on the number and volume of containers processed for recycling and disposal in *drumMUSTER* funded collection programs. Information obtained in earlier research and surveys on farm chemical container management issues as well as information on overseas container collection programs has also been used.

An invitation to provide comment and input to the review was sent to state government departments of environment and agriculture, signatories to the IWRS, Agsafe, state local government associations and state farmer organisations.

Feedback on the *drumMUSTER* program has been obtained from farmers, local government councils, crop protection and animal health retailers and drum processors through survey questionnaires forwarded by facsimile.

A copy of the draft review and a further invitation to comment was sent to the same group of interested parties. Discussions or telephone hook-ups were held with representatives of the NFF, ALGA, Agsafe, Avcare and VMDA.

REVIEW FINDINGS

Achievements of the Crop Protection and Animal Health Industry

Reducing the amount of packaging entering the distribution stream

The IWRS target for a reduction in the amount of packaging entering the distribution stream is a 32% reduction relative to the amount in 1990.

Because the volume of crop protection and animal health products used in Australia has more than doubled since 1990 and significant reductions in volume have been achieved through increasing the concentration of formulations, an assessment has been made by adjusting the 1999 packaging weight to account for these changes. As no data exists for 1990, the comparison is made against the industry audit for 1991.

Using the adjusted total for 1999 the crop protection and animal health industry has achieved a reduction of 26% in the amount of packaging entering the distribution stream in 1999, relative to 1991.

This has been achieved principally through the introduction of distribution systems for specially designed returnable containers which can be refilled and re-used, the use of shuttles and intermediate bulk (minibulk) containers to service large users, the development of new formulations of more concentrated liquid products and converting liquid products to more concentrated dry granular formulations.

Recycling and re-use of containers

The introduction of returnable containers for liquid products has resulted in 27.5 million litres of product (22% of the total liquid volume) being delivered in 1999, in containers that were returned to the manufacturer for refilling. The IWRS target is to achieve a level of 35% delivered in returnable containers by 2001.

For dry formulations the introduction of returnable containers has resulted in 912 tonne of product (5% of the total dry volume) being delivered in 1999, in containers that are returned to the manufacture for refilling. There was no target set for use of returnable containers for dry products in the IWRS.

For liquid products 180,000 non-returnable plastic 20L drums (7.5% of the total used by Avcare members) and 9,800 non-returnable 200L drums (11% of the total) were recovered, reconditioned and reused in 1999. The IWRS target is to achieve a level of 15% for plastic 20L drums and no target was set for 200L drums.

Improving Occupational Health and Safety

The packaging and transfer systems used with returnable containers for liquid products have reduced significantly the potential for operator exposure to the chemicals being handled. In addition, for dry formulations, the industry has introduced returnable container systems which lock directly onto application equipment and thus avoid operator exposure.

A majority of the farmers surveyed have received information about proper rinsing practices (85%) and the use of safer emptying and rinsing devices (67%).

Achievements of the drumMUSTER program – disposal and recycling of containers

Collection Disposal and Recycling of Empty Containers

Containers designed for a single use pose a potential threat to both public health and safety, and the environment if they are not correctly rinsed out after use. Recommended procedures require triple rinsing or pressure rinsing and cleaning, with the rinsate returned to the spray tank. Once a container is rinsed and cleaned it is no longer classified as a hazardous waste.

Under the *drumMUSTER* program local government councils are encouraged to enter into service agreements with Agsafe to establish collection programs and contract drum

processors, who have been approved by Agsafe, to process the collected containers so they can be utilised for recycling. A key requirement is that all containers must first be inspected to ensure that they have been properly rinsed and cleaned before acceptance.

The costs for running the inspection, collection and contract processing are reimbursed by Agsafe to the Council under a formula set out in the service agreement. The parameters for cost reimbursement are specified in the IWRS Agreement.

There were initial delays in establishing service agreements with councils. The first collection under the *drumMUSTER* program occurred in May 1999.

As of 1 October 2000, 223 councils out of a total of 630 (35%) have signed service agreements. Councils have been categorised as Priority Councils if the number of containers estimated to have been used in their area is more than 2,000. There are 303 Priority Councils and of these 173 (57%) have signed agreements. One hundred and nineteen councils have run a total of 326 collection campaigns. Agsafe are targeting to have agreements signed with 75% of the Priority Councils by December 2000 and 95% by June 2001.

The *drumMUSTER* programs run by councils have collected and processed around 590,000 steel and plastic containers weighing over 800 tonne since commencement. All drum processors approved by the *drumMUSTER* program must have a recycling market for all processed drums. The majority of the processed waste has been removed by the drum processor and is presumed to have been on-sold for recycling. However, there is no system in place currently that can confirm the amount of waste that is recycled or disposed of to landfill.

A supplementary survey of drum processors process by telephone and facsimile contact was undertaken late in the review when it became apparent that this was an important data gap. Eleven processors responded. Ten confirmed that all containers removed by them were used for recycling purposes either for re-use or manufacturing. One processor advised that all the plastic and 40% of the steel containers were recycled for manufacturing and 60% of the steel containers were landfilled.

Based on information provided by the Avcare container audit for 1999, it is estimated that 7,661 tonne of containers required disposal. The objective of the IWRS is to collect 66% of this waste by 2001.

In the 12 month period from 1 October 1999 to 30 September 2000 the *drumMUSTER* program collected 766 tonne (10% of 1999 total).

By way of an international benchmark, the collection program established by the crop protection industry in the USA collected 580 tonne of rinsed container waste in its first year of operation and the program in Canada collected an estimated 700 tonne of unrinsed containers in its first year.

Effectiveness of the *drumMUSTER* Program

Surveys conducted as part of this review have found widespread support for the program from among all stakeholders. All stakeholders who provided written submissions supported *drumMUSTER*.

There is a very high degree of awareness of the program (99%) among the farmers surveyed. The farmers surveyed for this review were all members of state farmer organisations and this awareness level reflects the support and effort of these organisations for the program. Another survey in Victoria undertaken for the EPA reported that 88% of farmers were aware of the program.

Where *drumMUSTER* collections have been established, comments included on the survey questionnaires returned reflected a high degree of satisfaction by farmers using the program, from participating Councils and from retailers.

Of the councils that have run collection programs, 78% were either very satisfied or satisfied with *drumMUSTER*, 14 % were somewhat satisfied while 8% said they were dissatisfied. The major reasons cited for dissatisfaction were poor farmers response (low collection rates), the high proportion of unrinsed containers presented (high rejection rate) and dissatisfaction with the performance of the drum processor. The major reasons for dissatisfaction with the drum processors cited were that the processor was slow in collecting drums or that no collection had occurred due to the low volume of drums.

Of the farmers that have disposed of containers in *drumMUSTER* collection programs 70% were either very satisfied or satisfied with *drumMUSTER*, 18 % were somewhat satisfied while 12% said they were dissatisfied. Reasons for dissatisfaction included the distance that had to be travelled and the inconvenience of the timing of the collection.

By contrast, comments on the survey questionnaires, reflected a high level of dissatisfaction among farmers and retailers in areas where no collection service is offered. Extending the reach of *drumMUSTER* to cover all farming areas over the next 6-9 months is the biggest challenge facing the program.

Effectiveness of the *drumMUSTER* levy in influencing consumer choice

It would require a much wider ranging and more representative survey of farmers' attitudes to make any definitive judgement on the impact of the levy on consumer choice. Based on the survey results for farmers and retailers, opinions are almost equally divided among both groups as to whether the levy as such, influences consumer choice or not.

Perhaps of greater importance, is the very high level of awareness of the *drumMUSTER* program among farmers.

In addition 88% of farmers surveyed were aware that they were paying a levy on containers on which the *drumMUSTER* logo was affixed.

The surveys conducted for this review have demonstrated that in areas where no *drumMUSTER* collection was available, this level of awareness has created significant tensions between farmers and their suppliers and their local Council. It seems likely that this tension has had a positive effect in terms of providing motivation for all parties to resolve whatever constraints there were to establishing a collection program.

Achievements of the Industry Waste Reductions Scheme in reducing weight of non-returnable containers disposed in landfill

In absolute terms the estimated weight of packaging that could potentially end up in landfill in 1999 has increased by 45% compared to 1991. This compares to the target of 68% envisaged by the IWRS for achievement by 2001.

However, the targets set in the IWRS did not provide a formula for adjustments to account for any increase in market volume (which has more than doubled since 1990) or for volume reductions due to increased active constituent concentration in formulations (16 million litres).

To provide an objective measurement of the effectiveness of the IWRS the weight of non-returnable containers entering the distribution stream in 1999 has been adjusted to take account of the increase in the market volume and the effect of increased concentration of formulations.

Based on the 1999 adjusted total there has been a 35% reduction in the weight of packaging that could potentially end up in landfill compared to the target of 68% in 2001.

This review is being undertaken in the early start-up phase of the *drumMUSTER* collection and recycling program. On the basis of the rate of increase in the number of councils providing *drumMUSTER* collection services, the rate of progress by industry in the expansion of returnable container systems and the impact of more concentrated formulations it seems

reasonable to conclude the target of a 68% reduction is achievable provided the market volume increase and formulation concentration increases are taken into account.

ADEQUACY OF DATA FOR THE REVIEW

Information provided by Avcare from its container audits has been an adequate source of data for the purposes of this review at a national level. The audits provide detailed statistics on the number, size and type (ie plastic, steel, paper etc) of non-returnable and returnable containers sold. These audits also provide statistics on the number of non-returnable containers collected, reconditioned and re-used. However, the Avcare data does not provide information about container usage at a regional or shire level. Comprehensive information on recycling of raw material containers used by manufacturers was not available.

The VMDA do not undertake container audits of their members although most of their members supplying to farmers are also members of Avcare and their container usage is included in the Avcare audit.

No information is available on the container usage of importers and manufacturers who are not members of Avcare or VMDA.

The Agsafe database which captures information from *drumMUSTER* collections provides an adequate source of data on container waste collected at both the national and regional level. Agsafe approves the drum processors contracted by councils for drumMUSTER collection programs and a condition of approval is that the processor has access to recycling markets for processed containers. However, there is no data available on the actual use of the containers processed and removed by the drum processing contractors. To fill this information gap a supplementary survey of drum processors was undertaken to find out the disposal route for the processed container waste removed by processors.

While the surveys undertaken for this review have provided valuable information their scope and sampling frame have been of necessity very limited, because of the budget constraints of the review and the exceedingly short time-frame available for the review to be conducted.

The surveys have effectively identified a wide range of issues, many of which had already been recognised by Agsafe, Avcare, Local Government Associations and the National Farmers Federation.

The sample of farmers was not representative of the farmer population as the questionnaires were only sent to farmers who were members of a farmer organisation. The National Survey of Farmers (McGuffog et al 1995) found that only 54% of farmer belonged to a farmer organisation. It also found that this group of farmers was more generally aware of the need for proper container rinsing and are likely to be early adopters. It is possible that any negative attitudes toward the *drumMUSTER* program found in this review, may underestimate those held in the wider farming community.

The time frame in which this review had to be conducted has significantly limited the scope and capacity of the review to use more extensive and more representative sampling of farmers, retailers and councils. It has also limited the opportunity for effective follow-up to obtain higher response rates.

2. RECOMMENDATIONS

Recommendation 1

1. Industry data gaps

Avcare should ask its members to implement information gathering systems to record recycling and re-use of containers used in the delivery and packaging of raw materials used in formulation and manufacture, for inclusion in future audits. In addition information on disposal of returnable containers that have passed their expiry date or have become unusable should also be gathered.

Avcare should also consider the feasibility of upgrading its current regional usage model for crop protection and animal health containers to enable a more accurate assessment of the effectiveness of the *drumMUSTER* program at a regional and state level.

(Refer Section 7.3 and Section 13)

Recommendation 2

2. Participation by Importers and Formulators who are not Members of Avcare or VMDA

Once further progress has been made in establishing *drumMUSTER* agreements with local government councils, parties to the agreement should consider establishing an active program to speed the participation of crop protection and animal health manufacturers, formulators and importers who are not contributing to the *drumMUSTER* levy.

(Refer Section 11.1)

Recommendation 3

3. Independent Audit of Levy Payments

To ensure confidence in the levy calculation and payment system, Agsafe should establish in conjunction with Avcare and VMDA members either some form of external quality assurance program and/or periodical auditing of each manufacturer participating in the *drumMUSTER* program to ensure that levy calculations and declarations are correct.

(Refer Section 11.1)

Recommendation 4

4. Collection of non-returnable containers for reconditioning and re-use

The parties to the IWRS should give consideration to a review of the future of the arrangements relating to the recovery and re-use of non-returnable (single trip) 20L plastic drums. The current target in the IWRS is for 15% of these containers to be recovered, reconditioned and re-used by 2001. However, it seems unlikely that this target will be achieved because manufacturers are concentrating their efforts into developing returnable container systems and many of the products included in this program are being converted from liquid suspension concentrate formulations to dry granular formulations.

(Refer Section 7.3 and 9.5)

Recommendation 5

5. Plastic recycling

The long-term viability of markets for processed plastic will be an important factor for the future of the *drumMUSTER* program. To protect this market, a quality assurance program should be implemented to confirm that inspection procedures are effective in ensuring that only clean containers enter the recycling stream. Manufacturers should ensure that products that may be absorbed by plastic containers, and that may render these unacceptable to users of the recycled plastic, are packaged in steel containers or in plastic containers treated to prevent

absorption. At the same time it is suggested that the plastic recycling industry and plastics industry are consulted about the long term requirements for this market.

(Refer Section 7.3 and 9.5)

Recommendation 6

6. Steel recycling

The failure by one drum processor to remove processed steel containers from collection sites is of concern to a number of councils. This is despite the fact that there is a long established steel recycling market which is supported by steel manufacturers and the container industry. A review should be undertaken to determine what impediments there are to removal of processed steel containers for recycling and this should include consultation with the metal can and other steel recycling programs.

(Refer Section 7.3 and 9.5)

Recommendation 7

7. Monitoring the disposal route of collected containers

While approval of drum processors is conditional on their having access to recycling markets for both processed plastic and steel containers there is currently no system in place to monitor the fate of containers removed from *drumMUSTER* collection sites. A system of monitoring the fate of collected material that takes account of any commercially sensitive market arrangements should be introduced as a condition of approval for *drumMUSTER* drum processors.

(Refer Sections 10 and 13.2)

Recommendation 8

8. Collection mechanisms for remote areas and those with low container numbers

A review of options to facilitate collection of containers from remote areas and those areas where there are low container numbers should be considered. This may need a departure from the model involving delivery by farmers to local government council sites. For example successful programs involving pick-ups from remote locations have been run in the Kimberley area of WA and in the Northern Territory. In Canada collections have been undertaken by organising to pick-up containers at designated times from retailer's sites where inspectors are present. The collected containers are then taken to a processing centre for shredding or crushing.

(Refer Sections 9.1, 9.2, 9.3, 9.4, 9.5)

Recommendation 9

9. Collection mechanisms for urban areas

Avcare members who supply the industrial herbicide, sporting club and pest control market are paying the levy into the *drumMUSTER* program. While the volumes of product going into these markets are relatively small compared to the agricultural market, consideration needs to be given to how collection programs for these markets can best be established.

(Refer Section 14 NSW EPA)

Recommendation 10

10. Improving the operating efficiency of drum processors

Consideration should be given to establishing a study aimed at improving the operating efficiency of the collection and drum processing systems. The study could look at the feasibility of developing regional collection schemes where a number of councils combine to share resources to reduce the cost of the program and to increase processing throughput. The

physical layout of collection sites and designated areas for processing, as well as operational issues at collection sites that may impact drum processing efficiency also need to be considered. There are already a number of regional arrangements in operation that could be the basis for case studies.

(Refer Section 9.5)

Recommendation 11

11. Promotion of drumMUSTER to Councils

This review and the survey of councils not yet participating in *drumMUSTER* provides a good indication of the impediments perceived or experienced by councils in entering into a *drumMUSTER* agreement. Consideration should therefore be given to using this information to develop a “questions and answers” promotional document aimed at those councils yet to enter the program.

For councils participating in the program the need to consult with local farmers about the most appropriate timing for collections and with retailers to assist in disseminating information and promotional material about collections need to be reinforced.

(Refer Sections 9.1 and 9.2)

Recommendation 12

12. Promotion of recommended rinsing practices to consumers

Consideration needs to be given to improving the level of adoption of proper rinsing practices by consumers. A concerted promotional campaign through crop protection and animal health retailers and possibly supported by a national public relations campaign should be considered. While farmer organisations have played a very effective role in promoting *drumMUSTER* to their members it is essential that the campaign reaches all farmers.

(Refer Section 11.3)

Recommendation 13

13. Promotion of drumMUSTER to Retailers

There is a high proportion (25%) of retailers who do not include the *drumMUSTER* levy statement on their invoices. While many of the reasons for this situation lie with the delay in establishing *drumMUSTER* collections in all major usage areas it will be important to progressively address this issue to ensure that the conditions of the IWRS are being met. At the same time other information and promotional issues should be considered:

- ?? how to manage empty containers in areas where a *drumMUSTER* collection is yet to be established
- ?? container eligibility and cleansing standards (especially for products such as suspension concentrates that may leave a caked deposit unless rinsed immediately they are emptied).
- ?? the need for consultation and cooperation between councils, retailers and local farmer organisations to plan and facilitate collection programs

(Refer Section 11.2)

Recommendation 14

14. Communicating the achievements of the IWRS and drumMUSTER

Consideration needs to be given to how best to provide regular updates to farmers, retailers and councils on the progress and success of the overall *drumMUSTER* program and the performance by Avcare and VMDA in meeting their obligations under the IWRS by reducing the amount of non-returnable containers reaching the market.

3. INTRODUCTION

National Strategy for the Management of Unwanted Empty Farm Chemical Containers

In 1990, the Senate Select Committee Inquiry on Agriculture and Veterinary Chemicals in Australia recommended a national strategy be developed for the safe and effective disposal of farm chemical containers.

At its March 1993 meeting, the Standing Committee on Environment Protection agreed that a Task Force be established with membership from the Commonwealth, New Zealand, Victoria, New South Wales, Queensland and Western Australia to develop a national strategy for these containers.

A draft strategy was released for public comment in June 1995. Comments were received from 107 different parties representing a broad range of industry, farmer and government interests.

In late 1996, a large scale pilot containers collection program was conducted by Avcare, the National Association for Crop Protection and Animal Health, in the Wimmera region of Victoria. The results of the program confirm that the approaches recommended in the strategy were practical and sufficiently flexible to be adopted nationally.

The Australian and New Zealand Environment and Conservation Council (ANZECC) issued the National Strategy for the Management of Unwanted Empty Farm Chemical Containers at its meeting in December 1997.

The National Strategy set out Implementation Principles which called upon Government in conjunction with industry to cooperatively implement the strategic principles of by adopting the following programs:

- I A voluntary industry waste reduction agreement between Avcare, the Veterinary Manufacturers and Distributors Association and ANZECC which incorporates: (i) container reduction targets and recycling targets based on metal being re-used or recycled for materials recovery and plastic containers being re-used or recycled for material or energy recovery with appropriate monitoring and reporting mechanisms; and (ii) a commitment to introduce appropriate financial support measures which have been supported by the National Farmers Federation and the Australian Local Government Association.
- II. Legislation dealing with agricultural and veterinary chemicals should be reviewed and amended if necessary to ensure that it does not impair implementation of an effective management system such as one that incorporates the use of refillable containers equipped with tamper evident one way valves.
- III. Farmers and other users to have the prime responsibility for delivering to collection points only:
 - ? rinsed visibly clean, dry empty non refillable plastic containers
 - ? rinsed visibly clean, dry empty non refillable metal containers
 - ? sound rinsed visibly clean empty containers that are included in commercial collection, reprocessing and re-use programs.
- IV. Effective farmer and user education on how and why to rinse containers is a vital component of the strategy. The education program should deal with both pressure and triple rinsing. In general, the most appropriate collection point will be a dedicated area located at a municipal landfill or recycling centre.

There is also need for a strategy to encourage municipal authorities to establish container depots where farmers may deliver their old chemicals containers for recycling or disposal.

- V. Effective farmer/contractor education on how to clean and dispose of empty containers used for farm chemicals that cannot be rinsed with water is another vital component of the strategy.

Industry Waste Reduction Scheme (IWRS)

In November 1998 the National Farmers Federation, Avcare Limited, the Veterinary Manufacturers and Distributors Association and the Australian Local Government Association entered into an Industry Waste Reduction Scheme Heads of Agreement (IWRS).

By the year 2001, the IWRS aims to reduce the weight of chemical container packaging by 32% and the weight of chemical container waste currently going to landfill by 68%, when compared to the estimate of the weight of packaging in 1990.

These targets will be achieved by implementing waste reduction strategies which:-

- a) encourage the continuing introduction of new product, packaging and distribution technology by manufacturers which reduces the number of containers requiring disposal, and
- b) fund the establishment of a system that delivers containers from farms and other premises for disposal or recycling.

Reducing the Amount of Packaging

The first of these strategies relies on the commitment of the crop protection and animal health industry to introduce the new packaging and technology and the willingness of the consumers to accept these changes.

Disposal and Recycling

The second of these strategies has been facilitated by the introduction of the *drumMUSTER* program. It is funded by a levy of 4 cents per litre or kilogram of the contained product for containers included in the program.

The four parties to the IWRS have agreed that Agsafe Limited (the subsidiary of Avcare set up to administer and deliver safety, environmental and accreditation schemes on behalf of the crop protection and animal health industry) should implement the program.

Manufacturers agreeing to participate in the proposal pay the levy into a fund administered by Agsafe. Manufacturers pass the levy on to distributors, who in turn pass the levy on to purchasers. The levy amount should be detailed on wholesale and retail invoices to ensure the transparency of the scheme.

The IWRS requires local governments to establish or facilitate the formation of collection centres for targeted containers.

Farmers and other users of crop protection and animal health products are responsible for correctly rinsing the containers as they are used, and then bringing empty, clean containers in to the collection centre.

Containers must be inspected upon arrival and those considered unclean are rejected. Clean containers are accepted and appropriately processed for re-use, recycling or disposal to landfill.

drumMUSTER pays the collection agency for the collection, inspection and processing services they provide.

To encourage the re-use of eligible containers originally intended for single use (non-refillable containers), a rebate equivalent to the levy will be paid to manufacturers who

repurchase reconditioned Containers.

Review of IWRS by ANZECC

In July 1999, ANZECC (Australian and New Zealand Conservation Council) requested Environment Australia (EA), in consultation with the States and Territories, to conduct an initial review of the *drumMUSTER* program. The purpose of the review is to establish whether the IWRS is achieving the implementation of the ANZECC strategy in a timely and effective manner.

The review is to be considered by ANZECC in December 2000.

4. TERMS OF REFERENCE

Environment Australia issued the following terms of reference for this review:

- A. The review of *drumMUSTER* will:
1. Examine the extent to which *drumMUSTER* is an effective strategy for the management of agvet chemical containers in Australia, by:
 - a) reviewing the aims, achievements and plans of the *drumMUSTER* program in achieving the aims and objectives of the Industry Waste Reduction Scheme Heads of Agreement; and
 - b) considering the effectiveness of the delivery mechanism for *drumMUSTER*, including the levy mechanism and its ability to influence consumer choice.
 2. In assessing the matters raised above, consult with signatories to the *drumMUSTER* agreement (VDMA, Avcare, NFF, ALGA), Agsafe, and other key stakeholders, including State government agencies, local government and chemical consumers.
 3. Produce a report to ANZECC by December 2000 containing recommendations as appropriate.
- B. In the Consultant's Brief, Environment Australia specified that the consultant should review achievements of the Industry Waste Reductions Scheme in addition to the review of the *drumMUSTER* program. The review will therefore assess progress achieved by the industry towards:
- ?? reducing the number of containers entering the distribution stream;
 - ?? increasing the re-use of containers originally intended for single use;
 - ?? increasing the recycling of containers.
- C. The Consultant's Brief also specified that the review should assess the availability and suitability of data to quantify achievements of the program.

5. REVIEW METHODOLOGY

Industry Waste Reduction Scheme Review (IWRS)

The IWRS sets out waste reductions targets. To assess progress toward these targets, McGuffog and Co obtained agreement from Avcare to:

- ?? utilise Avcare data collected from industry audits conducted since 1991,
- ?? utilise market research studies by Avcare which quantify the changes in the concentration of agricultural chemical formulations since 1991 and the conversion from liquid herbicide formulations to granular formulations.

From these data the mass of container packaging has been calculated using the average weight of various container sizes and materials of construction, to enable a comparison with the targets in the IWRS.

The data from Avcare has also been used to assess industry progress toward reduction in the number of containers entering the distribution stream; the re-use of containers originally intended for single use and the recycling of containers.

drumMUSTER Review

Data has been provided by Agsafe and the *drumMUSTER* database on collection statistics and the rate of uptake of the program by local government councils.

These data, and data gathered from the stakeholders in the Scheme by way of surveys of the stakeholder groups and submissions from them, has been used to assess the *drumMUSTER* program against the Terms of Reference.

To meet the requirements of the Terms of Reference, it was necessary to obtain direct feedback from individual local government councils, crop protection and animal health retailers, farmers and drum processors contracted by councils in collection programs. The following surveys were carried out using facsimile as the means of distributing the questionnaires:

1. Local Government Councils – A sample of 80 councils who have conducted collections and 80 councils who have not yet signed up with the *drumMUSTER* program were surveyed. The sample was representative of each state and was selected from *drumMUSTER*'s database.
2. Retailers – A sample of 280 crop protection and animal health retailers operating in the post code area of the councils selected above were surveyed. As far as possible two retailers were selected from each council area using Agsafe's database of accredited retailers. For some council areas it was not possible to find retailers with matching post codes.
3. Farmers – A total of 185 farmers were surveyed. State farmer organisations were approached to provide the name and fax number of two farmers who operated in the post code areas of the councils selected above. In most states, contact names and fax numbers were provided to McGuffog & Co who sent out the survey. In one State, field officers of the organisation distributed the questionnaire.
4. Drum processors – There were 13 processors approved by *drumMUSTER* at the time of the review and all were sent questionnaires.

The design of the questionnaire for each group surveyed was developed to address the issues defined in the Consultant's Brief and comments on the initial draft were invited from Environment Australia, signatories to the IWRS, Agsafe, state local government associations and state farmer organisations.

A freecall return facsimile number and reply paid mail address was provided to maximise responses from those included in the survey.

Submissions on the drumMUSTER program were invited from state local government associations, state farmer organisations and state government departments responsible for environment and agriculture.

Availability and suitability of data to quantify achievements of program

This assessment has been made on a review of the data provided by Avcare, Agsafe and Environment Australia and the quality of the data obtained from the surveys undertaken.

6. AIMS AND OBJECTIVES — INDUSTRY WASTE REDUCTION SCHEME HEADS OF AGREEMENT (IWRS)

6.1 Targets

By the year 2001, the IWRS aims to: (i) reduce the weight of chemical container packaging by 32%; and (ii) reduce the weight of chemical container waste going to landfill by 68%, when compared to the estimate of the weight of packaging in 1990.

These targets will be achieved by implementing waste reduction strategies which:-

- a) encourage the continuing introduction of new product, packaging and distribution technology by manufacturers which reduces the number of containers requiring disposal, and
- b) fund the establishment of a system that delivers containers from farms and other premises for disposal or recycling.

The targets as stated did not provide any formula to adjust for any growth in the market. The estimated weight of non-returnable packaging used in 1990 was 4,880 tonne and the volume that could potentially go to landfill was estimated at 4,790 tonne. The latter figure was calculated by deducting the estimate of the weight of re-used packages from the total weight of non-returnable packaging used. (McGuffog D.R. 1998)

6.2 Objectives

Implementation of the IWRS will, through research and development in new formulation and packaging technologies, reduce the number of containers entering the distribution stream, increase the re-use of containers already in the distribution stream, increase the recycling of containers for material recovery, and improve occupational health and environmental practices.

Reducing the number of containers entering the distribution stream

The industry target for the year 2001 will be to:

- ?? deliver 35% of its liquid products in either bulk or refillable containers,
- ?? increase the total market share of dry chemical formulations to 23%;
- ?? produce 9% of its dry and gel formulations in water soluble packages.

Increasing the re-use of containers originally intended for single use

The industry target for the year 2001 will be to.

- ?? collect, re-process and re-use 15% of all 20 litre plastic containers.

Increasing the recycling of containers for material recovery

The industry target for the year 2001 will be to:

- ?? increase the participation of local governments in container inspection, recycling and disposal programs,.
- ?? recover 66% of empty clean and rinsed chemical containers;
- ?? supply 50% of raw materials in recyclable or returnable packaging.

Co-operation with general packaging industry programs

The IWRS will co-operate with general packaging industry programs and steel can recycling initiatives to promote the return or recycling of packaging such as cardboard outers, pallet wrapping and strapping.

Improving occupational health and environmental practices

The industry target for 1998 will be to:

- ?? ensure all Agsafe accredited premises carry promotional point-of-sale brochures and posters which promote proper rinsing practices.

Promotion of easier to rinse and safer packaging

The IWRS will also promote the adoption of easier to rinse and handle packaging, the use of safer emptying and rinsing devices, and the management of chemical containers in an environmentally appropriate way.

7. CROP PROTECTION AND ANIMAL HEALTH INDUSTRY — PERFORMANCE AGAINST OBJECTIVES OF IWRS

7.1 Basis for Assessing Performance against IWRS Targets

In absolute terms the estimated weight of packaging that could potentially end up in landfill in 1999 has increased by 45% since 1991. The IWRS reduction target for 2001 was 68%. Given the increase in the market size since 1991, it would appear that this reduction target would not be attainable.

However, the targets set in the IWRS did not provide a formula for adjustments to account for:

- a) Any increase in market volume
- b) Volume reductions due to increased active constituent concentration in formulations.

To provide an objective measurement of the effectiveness of the IWRS the weight of non-returnable containers entering the distribution stream in 1999 has been adjusted to take account of the increase in the market volume and the effect of increased concentration of formulations. The adjustment procedure is explained below.

It must also be recognised that this review is being undertaken in the early start-up phase of the *drumMUSTER* collection and recycling program.

Increases in market volume

The decade spanning the 1990s has seen a significant change in the productivity of Australia's agricultural and livestock industries.

The total area devoted to cropping has expanded significantly. The area devoted to the major broadacre crops (grains & oilseeds, cotton and sugar cane) expanded from 15.6 million ha in 1988/89 to 21.1 million ha in 1998-99, an increase of 35%.

The grains and oilseed industries are the major users of crop protection products and are estimated to account for around 60% of the usage.

In this period, the productivity growth on grain specialist farms increased at 3.6 per cent a year. This is attributed to a number of factors including, better farm management, advances in plant breeding, improved crop rotations with better pest and weed control, development of new herbicides, more efficient fertilizer use, larger scale farming and advances in tractor and machinery design.

There has also been a marked shift away from traditional tillage practices and toward conservation tillage practices. The adoption of direct drilling and minimum tillage in grain and the adoption of trash retention in sugar cane has contributed significantly to a reduction in soil erosion as well as improved productivity in many areas.

As a consequence of these changes in farm management practices the usage of crop protection products, and particularly herbicides has increased.

For example, the usage of crop sprays by cropping specialist increased by 7% pa in the period 1988-89 to 1998-99 (Knopke et al 2000).

While cropping areas have increased there has been a decline in livestock numbers and sales of animal health products have not increased in sales value since 1991.

Figure 7.1 illustrates the trend in increased cropping areas and increases in the sales value and sales volume of crop protection products between 1991 and 1999.

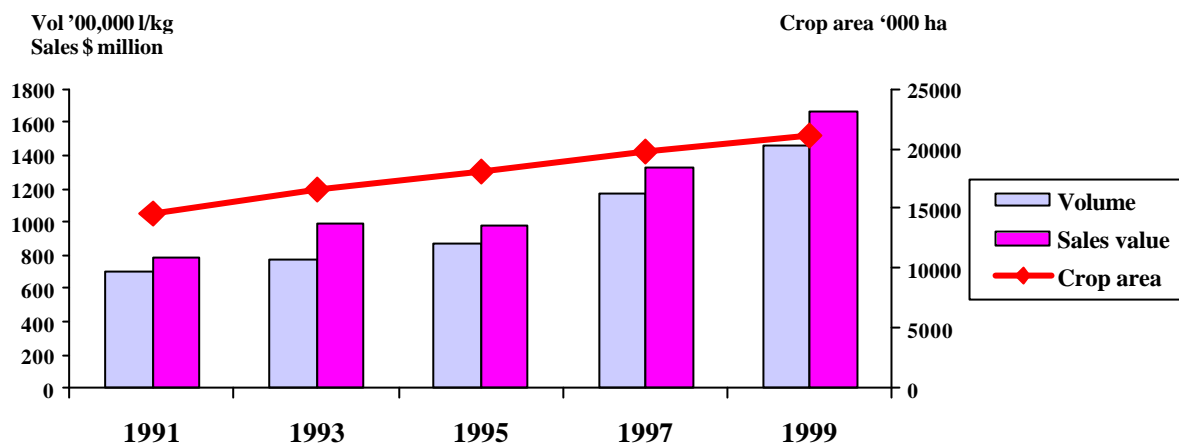
The only available benchmark for the volume of farm chemicals used in 1990 is the information from an industry survey conducted by Avcare for calendar year 1991. At that

time it was estimated that the survey covered 80% of the crop protection and animal health industry.

Avcare has conducted regular container audits since that time and the results of these audits are shown in Table 7.1. The overall sales volume in 1999 has increased by 107% over 1991.

The same trends are reflected in the sales value of crop protection products which increased from \$782 million in 1991 to \$1,666 million in 1999 also shown in Figure 7.1.

Figure 7.1 Trends in area of crops, sales of crop protection products and volume of crop protection and animal health sales



Adjusting for changes in the concentration of formulations.

However, the audit figures do not show the impact of formulation and technological change which has resulted in a reduction in the volume of product used.

The most significant changes that have occurred since 1990 are:

- ?? The concentration of 4 major herbicide product types (glyphosate, paraquat trifluralin and metolachlor) has been increased (glyphosate from 360g/L to up to 540 g/L, paraquat from 200 g/L to 250 g/L and trifluralin from 400 g/L to 480 g/L and metolachlor from 720g/L to 960 g/L).
- ?? The introduction of new formulation technology enabling the change from suspension concentrate formulations of triazine herbicides containing 500g/L to granular formulations containing 900 g/kg.

Based on market research data supplied by Avcare these two changes have resulted, in 1999, in a reduction of 16.5 m litres in the volume of herbicides, based on formulations in use in 1991 compared to those in use in 1999. In other words, based on the previous formulations as at 1991, the volume of product used in 1999 as shown in Table 7.1 would have been 162,300 kL/tonne (not 145,800).

Assumptions used to adjust 1999 figures for assessment purposes

The Audits undertaken by Avcare detail the size and material from which the primary packaging is constructed (e.g. plastic, metal, glass, paper, cardboard). By using the typical weight of each type of container it is then possible to calculate the tonnage of primary container waste that reaches the market. A 20L plastic container weighs 1.2 kg and a 20L steel container weighs 1.8 kg.

In 1991 3.1% of the liquid volume was delivered in bulk or refillable containers compared to 21.6% in 1999.

If there had been no changes in the volume delivered in bulk and refillable containers since 1991, there would have been an increase of 23,500 kL in the volume of packaged products used in 1999.

As indicated above the volume reduction due to formulation changes has been calculated to total 16,500 kL.

Thus an additional 40,000 kL of packaged products would have entered the distribution stream in 1999, if these changes had not been introduced by the crop protection and animal health industry.

The weight of the additional packaging has been calculated by assuming that the packaging used were 20L containers and that the proportion of steel and plastic containers used were in the same proportion as that found to be used by Avcare members in the 1999 Avcare Container Audit. The 1999 adjusted weight is shown in Table 7.2.

Table 7.1 - Total volume sold by Avcare members in 1991,1993, 1995, 1997, 1999 and IWRS targets for 2001

	1991	1993	1995	1997	1999	Target 2001
Total volume kL / t	70,317	76,863	85,669	116,299	145,855	
Total liquid volume (kL)	58,437	64,446	72,707	104,911	127,354	
Total dry volume (tonne)	11,880	12,417	12,962	11,258	18,501	
Liquid volume in bulk & refillables (kL)	1,825	5,510	5,697	16,048	27,460	
20 L plastic containers used (no.)	999,500	1,294,392	1,530,835	2,071,927	2,387,079	
20L plastic containers re-used (no.)	50,000	75,000	127,000	234,000	180,000	
200L containers re-used (no.)	n/a	n/a	n/a	15,000	9,800	
Dry volume in bulk (tonne)	0	0	0	191	912	
Dry volume in water soluble packs (tonne)	0	103	190	151	171	
percentage liquid	83.11%	83.8%	84.9%	90.2%	87%	77%
percentage dry	16.89%	16.2%	15.1%	9.8%	13%	23%
Liquid percentage (bulk & refillables)	3.1%	8.5%	7.8%	15.3%	21.6%	35%
Dry percentage in refillables	0%	0%	0%	1.7%	4.9%	n/t*
Dry percentage in water soluble	0%	0.8%	1.1%	1.4%	0.9%	9%
Percentage 20L plastic re-used	5.0%	5.8%	8.3%	11.2%	7.5%	15%

Source — Avcare Container Audits 1991–1999

* n/t – no target set

7.2 Performance against Waste Reduction Target

There is no data available on the weight of packaging entering the distribution stream in 1990 and the benchmark used in this review is the 1991 Avcare survey of its member's container use.

In absolute terms the estimated weight of packaging that could potentially end up in landfill increased from 4,818 tonne in 1991 to 7,001 tonne in 1999 (see Table 7.2), an increase of 45%. This compares to the target of a 68% reduction envisaged by the IWRS.

Table 7.2 shows the actual weight of primary packaging material reaching the market in 1991 and 1999 and the weight of packaging in 1999 if there had been no changes to formulation concentrations and if the proportion delivered in bulk and returnable containers was the same as in 1991.

Table 7.2 — Weight of primary packaging waste delivered — (1L/kg or over) and reduction achieved (tonne)

Packaging	1991 Actual weight	1999 Actual weight	1999 Adjusted weight	% change compared to 1999 adjusted weight
Plastic (rigid)	1,566	3,728	5,298	-29.6
Metal (rigid)	2,982	3,716	4,934	-24.7
Non-rigid	330	638	638	0
TOTAL	4,878	8,082	10,870	-25.6
Weight collected for re-use	(60)	(421)	(60)	
Nett	4,818	7,661	10,810	-29.1
<i>drumMUSTER</i> collections Oct. 1999 to Sept. 2000		766*		
Balance of packaging that could go to landfill	4,818	7,001	10,810	-35.2

Source – Avcare audits 1991 and 1999

* not all of the collected material went into recycling uses (see Table 9.3) but no figures are available on the amount that was landfilled and the total collected in the period indicated has been used in this calculation.

Based on the 1999 adjusted total there is a reduction of 26% in the weight of packaging entering the distribution stream (versus a target of 32% for 2001) and a 35% reduction in the weight of packaging that could potentially end up in landfill (versus a target of 68% in 2001).

7.3 Performance against Packaging Objectives

The IWRS set out objectives for changes in packaging which if achieved would enable the industry to achieve the waste reduction target discussed above.

These objectives were based on a survey of Avcare members conducted in 1996-97. To ensure that perceptions about market share changes or changes in the market size did not distort the result, companies were asked to forecast the changes in packaging only using their 1995 container audit submissions as the benchmark.

Packaging objectives were then expressed as proportions rather than as absolute volumes. This has enabled a direct assessment of industry performance to be made which takes account of changes in the market size.

The performance against the packaging objectives is shown in Table 7.3.

The results illustrate that a number of the anticipated technology changes did not prove to be technically successful or were not accepted by the market.

Table 7.3 — Industry Packaging Objectives

	Percentage liquid in bulk or refillable	Percentage of 20L as plastic re-used	Percentage of 200L containers as re-used	Percentage as dry formulation	Percentage dry in bulk or refillable	Percentage of dry/gel in water soluble
1999	21.6%	7.5%	11.3%	12.7%	4.7%	0.9%
Target 2001	35%	15%	No target	23%	No target	8%

Distribution in bulk or refillable containers

Table 7.1 shows that the widespread adoption and market acceptance of refillable (returnable) containers did not commence until after 1995. However, based on the rapid expansion of adoption since 1997, and assuming this trend continues, it would appear that the industry is capable of achieving its objectives by 2001.

Re-use of plastic single trip 20L containers

The proportion of 20L containers that are collected and returned to specialist drum processors for reconditioning and re-use for the same product has declined since 1997. The decrease in use of these reconditioned 20L drums is due to reduced usage by two companies. However, the same two companies increased their deliveries in bulk and returnable containers from 3.5 million litres in 1997 to 8.4 million litres in 1999.

DSL Drum Services (DSL) is the only operator providing this form of recycling. They operate one plant in Melbourne Victoria, and one in Kwinana WA.

There are cost impediments to this form of recycling including recovery and transport costs.

To offset these costs the IWRS provides for a rebate of 80 cents per 20L container to manufacturers who re-use containers recovered and re-processed by DSL.

Both Agsafe and DSL have reported that not all manufacturers are claiming this rebate in calculating their levy payment to the *drumMUSTER* program. The reason put forward is that the number being purchased by these companies is very small.

DSL report that *drumMUSTER* collections have not resulted in an increase in the return of 20L drums eligible for this re-use program and that many such drums are granulated by the drum processor at the collection site, rather than being retained for collection by DSL.

In Western Australia the main recovery method for these containers is via community based organisations who facilitate their collection into a central location and DSL arrange transport to their processing plant. DSL pay the community group a collection fee but are not eligible for any direct payment from *drumMUSTER*. However, it should be noted that *drumMUSTER* is indirectly subsidising this program via the 80 cent rebate available to manufacturers purchasing these containers.

The majority of products included in this program are suspension concentrate formulations which do not lend themselves to delivery in returnable containers because their physical quality is not compatible with the extraction system used with these containers. As noted elsewhere in this review, many companies are changing away from suspension concentrate formulations in favour of higher concentration dry granular formulations.

Consideration should be given by the parties to the IWRS to a review of the arrangements relating to drum re-use programs. (see Recommendation 4).

Re-use of single trip 200L containers

The re-use of 200L drums was not anticipated when the packaging objectives were set. The re-use of 200L drums has offset to some degree the lower re-use of the 20L container.

Increasing the use dry formulations

The development of granular formulation technology has enabled manufacturers to formulate a wide range of herbicides as water dispersible granules containing up to 900 g/kg active constituent. These formulations have steadily displaced suspension concentrate formulations of the same active constituent, which typically contain 500g/L or less.

Table 7.1 shows that the proportion of dry formulations to liquid formulations decreased from a high of 16% in 1993. Avcare have commented that the decrease is largely attributable to a change away from low concentrate dust formulations in the period 1993 to 1996, and note that there has been a steady increase since the 1997 Audit.

Avcare studies show that granular herbicide formulations have displaced 6.5 million litres of liquid formulations.

Delivery of dry formulations in bulk or refillable containers

The adoption of refillable containers for dry formulations was not anticipated when the packaging objectives were set. While these delivery systems do not make a big contribution to waste reduction they do represent a significant advance by introducing a safer packaging and handling system for products with high dermal and inhalation toxicity.

Use of water soluble packaging for dry/gel formulations

This is an attractive concept in packaging. It reduces operator exposure and the primary package dissolves in the spray tank, thus leaving no primary container to be disposed of.

However, it has not been widely adopted and it seems very unlikely that the original objectives will be met.

Avcare studies show that there are two major reasons which have inhibited the adoption of the technology:

- ?? compared to alternate packaging it is much more costly. For example it costs twice as much per unit of active constituent to package a dry formulation of 2,4-D herbicide.
- ?? It has not been widely adopted in broadacre low volume spraying where technical difficulties arise because of the low volume of water used in the spraying operation.

There is considerable anecdotal evidence that farmers will not pay a premium for this type of packaging.

Genetically modified cotton

The introduction of Ingard[®] cotton has led to a reduction in the amount of cotton insecticide used. In areas where it is used Avcare estimate that insecticide usage has been reduced by 43%.

Occupational Health and Safety

The large scale adoption of bulk and refillable containers is contributing to a reduction in the potential exposure of operators handling products distributed this way. The valves and dry-break couplings available for use with refillable containers such as Envirodrums reduce the potential for operator exposure to an absolute minimum.

The introduction of returnable, refillable dry formulation containers has also significantly contributed to a reduction in the risk of operator exposure. These are essentially a closed system with the container fitting directly onto the applicator.

Raw Material Container Recycling

Avcare's container audit for 1999 revealed that a number of companies had not instituted systems to record the necessary information to enable the level of recycling and use of refillable containers to be measured. (see Recommendation 1)

However, it is clear from several companies that record the re-use and recycling that companies have instigated re-use and recycling programs for this packaging.

For example, Table 7.4 shows the level of re-use and recycling of imported technical grade active constituent containers by one major formulator.

Cooperation with other industry recycling programs

To date no specific information has been provided for this review in relation to the extent of cooperation with other industry programs. (see Recommendations 6 and 7)

Promotion of easier to rinse and safer packaging

The extensive use of refillable containers such as Envirodrums has improved significantly both the safety and ease of use of packaging.

Table 7.4 Raw material container recycling by one formulator

Size L	Steel			Fibre board & bags			Flexible bulk containers		
	Re-used	Recycled	Scrap	Re-used	Recycled	Scrap	Re-used	Recycled	Scrap
50 or less			220			6,330			
51-100			180			400			
101-200	3,220	1,280	1,350						
500-700							418		16
23,000		10							

Source – Avcare audit 1999

Any attempt to make wholesale changes in single trip container design is a complex task because of the variety of emptying and rinsing devices in use by farmers.

In a survey of ground spread contractors conducted for Avcare in 1996 (McGuffog et al 1996) it was found that most large scale operators have equipment designed to safely and efficiently handle the current range of 20L drum designs. For smaller operators the 10L plastic container was rated as the easiest to handle and pour from and the easiest to rinse.

Table 7.5 shows the proportion of 10L containers as a percentage of the liquid packaged volume has increased as follows:

Table 7.5 Use of 10L containers

Year	Percentage of packaged volume
1995	2.1
1997	2.5
1999	3.75

8. AIMS AND OBJECTIVES - *drumMUSTER* PROGRAM

The key objective for the *drumMUSTER* program is to establish a system that delivers empty containers from farms and other premises for disposal or recycling and in doing so achieve a reduction in the weight of chemical container waste currently going to landfill by 66%, when compared to the estimate of the weight of packaging in 1990.

The following objectives of the Industry Waste Reduction Heads of Agreement are facilitated by the *drumMUSTER* program.

Increasing the recycling of containers for material recovery

The industry target for the year 2001 was to:

- ?? increase the participation of local governments in container inspection, recycling and disposal programs,.
- ?? recover 66% of empty clean and rinsed chemical containers;

Co-operation with general packaging industry programs

The IWRS will co-operate with general packaging industry programs and steel can recycling initiatives to promote the return or recycling of packaging such as cardboard outers, pallet wrapping and strapping.

Improving occupational health and environmental practices

The industry target for 1998 will be to:

- ?? ensure all Agsafe accredited premises carry promotional point-of-sale brochures and posters which promote proper rinsing practices.

9. *drumMUSTER* — SURVEY RESULTS

9.1 Local Government Councils (that have run collections)

Sample size and survey response rate

Eighty councils running *drumMUSTER* collections were surveyed and 51 (64%) responded.

Survey findings

Satisfaction with *drumMUSTER*

Of those councils participating in *drumMUSTER* 78% reported being satisfied or very satisfied with the *drumMUSTER* program overall; 14% are somewhat satisfied and only 8% are dissatisfied. The major reason nominated for dissatisfaction with the *drumMUSTER* collection program was farmer apathy (see Appendix (I)).

Success of *drumMUSTER*

In terms of meeting the aim of removing empty farm chemical containers from the waste stream process, and where appropriate, reconditioning, re-using or recycling them 76% of councils view the *drumMUSTER* program as being successful or somewhat successful. Twelve per cent of councils view *drumMUSTER* as being unsuccessful and 4% view *drumMUSTER* as being very unsuccessful. The major reasons stated for this lack of success were poor farmer participation and apathy, low collection rates and difficulties in cleaning containers.

Difficulties with *drumMUSTER*

Problems or difficulties with *drumMUSTER* were experienced by 55% of councils. The main problems cited cover four main areas: farmers, council resources, cleaning containers and drum processors.

- a) **Farmers:** poor farmer participation (sometimes due to inconvenient collection times); poor punctuality for appointments, farmers not briefed on *drumMUSTER* requirements by farmer organisations; farmers not understanding the benefits of investing their time to rinse and deliver drums to *drumMUSTER*; and a perceived lack of farmer enthusiasm.
- b) **Council resources:** achieving full cost recovery of *drumMUSTER*, administrative workload, staffing issues, communicating effectively to farmers with a limited budget, receiving non eligible containers and constructing compounds at short notice.
- c) **Cleaning containers:** some chemicals are difficult to clean, lack of knowledge about Avcare standards.
- d) **Drum processors:** getting containers removed from the site, refusal of drum processor to remove steel drums.

Satisfaction with Drum Processor

The majority of councils were satisfied with their drum processor, with 79% reporting very satisfied or satisfied. Dissatisfaction with drum processors was reported by 14% of councils. The main reasons given for dissatisfaction were that the drum processor was slow in collecting drums or that no collection had occurred due to the low volume of drums. In Tasmania there was no drum processor and there were insufficient collections to justify a mainland processor travelling to Tasmania.

Further analysis of the survey data has shown that of those councils who had experienced problems with the *drumMUSTER* program a little under one-third (29%) reported that they were dissatisfied with the drum processor. However, only 5% of councils who experienced no problems with the *drumMUSTER* program, reported dissatisfaction with the drum processor.

While it may not be possible to infer a causal connection between these two factors, it is reasonable to conclude that the problems that are experienced, may be due, in part, to issues related to the drum processor.

In a series of separate questions in the survey council were asked to rate their degree of satisfaction with key aspects of the *drumMUSTER* program. This also contained a question about satisfaction with the drum processor (see Table 9.4)

Container Inspectors

Container inspectors trained by *drumMUSTER* were used by 98% of councils. Around two-thirds of container inspectors reported no problems or difficulties with the process of inspecting returned chemical containers. Of the 33% of inspectors who reported problems, the most significant issue involved the adequate cleaning of drums. Difficulties experienced included receiving uncleaned or poorly rinsed containers, including drums with difficult to clean residues, and making judgements on cleanliness. It was noted that it is difficult to see inside some drums for inspection purposes, depending on the design of the drum. Other problems included container eligibility confusion and farmers breaking appointments.

Container rejection rate

The rejection rate of inspectors was relatively low with 62% of councils having a rejection rate between nil and 5%. Twenty three percent of councils had a rejection rate between 6% and 19% and 15% of councils had a rejection rate above 19%.

Desire to dispose unwanted chemicals at *drumMUSTER*

Farmers seeking to dispose of unwanted chemicals at the *drumMUSTER* collection site were reported by 44% of inspectors.

Disposal trends of accepted chemical containers

Of the chemical containers that have been accepted at *drumMUSTER* collection sites, the majority have been removed from the site by the drum processor or have been retained either for sending, or have been sent to DSL Drum Services.

A high proportion of drums collected were removed by the drum processor with 29% of councils reporting that the drum processor collected 100% of their drums. However 23% of councils indicated that no drums were collected by the drum processor (see Table 9.1). In many cases this was due to low container volumes being uneconomical for the drum processor to collect.

Table 9.1: Percentage of containers removed by drum processor

% of accepted containers collected by drum processor	<i>f</i>	%
0%	11	23
1% -29%	0	0
30% -50%	9	19
51% -90%	6	12
91% -99%	8	17
100%	14	29
TOTAL	48	100

Frequency missing = 3

Only 15% of councils responded that all of their drums were sent to DSL Drum Services, while 63% responded that no drums were sent there (see Table 9.2).

Landfilling did not occur at 56% of councils. The frequency of landfilling of accepted chemical containers is detailed in Table 9.3. Although no quantitative data has been obtained, it would appear from survey responses that all of the material landfilled has been steel containers and has only occurred with one processor. This is despite the fact that well established steel container recycling programs have been operating for a number of years.

Perceived farmer satisfaction with *drumMUSTER*

The councils surveyed perceive a high level of farmer satisfaction with the *drumMUSTER* program, based on farmer feedback to inspectors at collections. 20% of councils responded that farmers seemed very satisfied with the *drumMUSTER* program and 76% responded that farmers seemed satisfied or somewhat satisfied.

Table 9.2: Percentage of containers collected by DSL Drum Services

% of accepted containers retained for sending or sent to DSL Drum Services	<i>f</i>	%
0%	30	63
1%-20%	7	14
21%-49%	0	0
50%-90%	4	8
91%-99%	0	0
100%	7	15
TOTAL	48	100

Frequency missing =3

Table 9.3: Percentage of containers accepted for landfill

% of accepted containers landfilled	<i>f</i>	%
0%	27	56
1%-5%	8	17
6%-9%	0	0
10%-20%	4	8
21%-26%	0	0
27%-45%	6	13
46%-49%	0	0
50%-60%	3	6
61%-100%	0	0
TOTAL	48	100

Frequency missing = 3

Council satisfaction with operational aspects of *drumMUSTER*

Overall councils are satisfied with the operational aspects of running *drumMUSTER* collections (see Table 9.4). The service agreement between *drumMUSTER* and Agsafe are

viewed as satisfactory or very satisfactory by 84% of councils with no councils reporting any dissatisfaction.

The reimbursement process is viewed as satisfactory by 63% of councils. Similarly the adequacy of the levy to cover costs of the program are viewed as satisfactory or very satisfactory by 50% of councils.

Nine councils (19%) were either dissatisfied or very dissatisfied with the adequacy of the levy to cover costs of program. An analysis of the responses to other questions on the operational aspects of the program are shown in Table 9.5. This group is characterised by experiencing high container rejection rates, dissatisfaction with the drum processor and poor response from farmers.

Promotional support from *drumMUSTER* is very good however, 24% of councils are dissatisfied with promotional support from chemical retailers.

The availability of drum processors could be improved, with 17% of councils reporting that they are dissatisfied with availability. (see Table 9.4).

Table 9.4: Council Satisfaction with Key Aspects of the *drumMUSTER* Program

	Satisfied		Somewhat Satisfied		Dissatisfied	
	f	%	f	%	f	%
<i>drumMUSTER</i> service agreement between Councils and Agsafe	41	84	8	16	0	0
Reimbursement process to cover costs of drumMUSTER	30	63	13	27	5	10
Adequacy of promotional support from <i>drumMUSTER</i>	34	67	12	23	5	10
Adequacy of promotional support from local farm chemical retailers	22	44	16	32	12	24
Adequacy of levy to cover costs of program	24	50	15	31	9	19
Availability of approved materials recovery processors	34	71	6	12	8	17
Performance of approved materials recovery processors	33	79	3	7	6	14
Process for training inspectors through drumMUSTER	43	84	8	16	0	0

Respondents were able to indicate more than one answer so total will not equal 100

The process of training inspectors through *drumMUSTER* is viewed by 84% of councils as satisfactory, with no councils reporting any dissatisfaction.

Consultative mechanism with farm chemical retailers

Over half the councils (55%) have not established a consultative mechanism with farm chemical retailers to inform them of plans for *drumMUSTER* collection programs. Where councils do have a mechanism in place (45%) consultation tends to involve advising retailers

when collections are to occur, having retailers display posters, providing press releases for inclusion in retailer newsletters, and sending letters to retailers. Some councils take this a step further with a more personal approach, making direct phone contact with retailers, having inspectors visit retail outlets, holding public meetings, forming regional waste management groups, forming *drumMUSTER* working group committees and even meeting with retailers prior to and after collections have occurred.

Table 9.5 Responses of councils that have run collection programs who have answered dissatisfied or very dissatisfied to the question "How satisfied is your Council with the adequacy of the levy to cover costs of the *drumMUSTER* program?"

Survey ID	Satisfaction with <i>drumMUSTER</i>	Success of <i>drumMUSTER</i>	Difficulties with <i>drumMUSTER</i>	Satisfaction with drum processor	Inspection problems	Levy collection rate	Reimbursement process	Availability of approved drum processors	Performance of drum processors	Consultative mechanism in place	Other comments
001	Yes	Somewhat	Early stages only	Dissatisfied -unreliable, unorganised	High rainfall causes water to enter stockpiled containers	10%		Dissatisfied	Dissatisfied	Yes	
002	Very satisfied	Very successful	No	Very satisfied	Uncleaned containers	40%		Very satisfied	Very satisfied	No	Levy should be increased to cover costs in organising the event and non-lavish advertising
007	Somewhat	Unsuccessful	Yes-some chemicals difficult to remove residue	Dissatisfied-has not removed containers from first round collected	Yes-residue on drums, farmers not keeping to booking times; not cleaning containers sufficiently	60%		Dissatisfied	Very dissatisfied	No	
013	Somewhat- even though council reimbursed for its costs- admin/paperwork is onerous	Very unsuccessful-farmer apathy	Yes-getting farmers to use the scheme	Have not collected sufficient drums to use a processor yet	Yes-uncleaned containers	30%	Dissatisfied	Satisfied		Yes	Paperwork must be reduced or more councils will decide to opt out
014	Somewhat	Unsuccessful-poor farmer response	Yes-Tasmania - no recyclers	No processors in TAS	Yes-uncleaned containers; container eligibility	10%		Dissatisfied	N/a	Yes	
026	Dissatisfied-poor response	Very unsuccessful-low numbers of drums collected	Yes-farmers not punctual	Dissatisfied-drums not collected yet	No	Low				No	
035	Satisfied	Very successful	Yes-communicating effectively to farmers with limited budget	Very satisfied	No	7%	Satisfied	Very satisfied	Very satisfied	Yes	Dissatisfied with promotional support from retailer
038	Dissatisfied-local cotton growers should perform the task	Unsuccessful-steel drums still need to be buried	Yes-difficulties with drum processor; recovering full costs of service	Dissatisfied-would not remove steel drums from site once crushed	No	5%	Dissatisfied	Dissatisfied	Very dissatisfied	No	Dissatisfied with promotional support from retailer
048	Somewhat satisfied	Successful	Yes-farmers not understanding cleanliness issue; council having to subsidise costs associated with dM	Satisfied	Yes-hostile farmers if drums rejected; lack of knowledge of the program by farmers	32%	Somewhat satisfied	Satisfied	Satisfied	Yes	

Further comments

When invited to make further comments about the *drumMUSTER* program many councils participated. A summary of their responses is listed below. (The complete responses are listed in Appendix I)

***drumMUSTER* program**

- ?? *drumMUSTER* is an excellent program
- ?? Council won an environmental reward for its *drumMUSTER* program
- ?? More manufacturers should be part of the program
- ?? Need greater control over ownership of containers i.e. purchaser of container must account for its disposal

Administration

- ?? Levy should be increased to cover council's costs
- ?? Paperwork must be reduced (or more councils will stop participating)
- ?? Improved point of sale material would make *drumMUSTER* more effective

Farmers

- ?? Farmer dissatisfaction if high rejection rate of non-stickered drums
- ?? Farmer education required (economic and environmental reasons for *drumMUSTER*)
- ?? Farmers who understand cleanliness standards are very satisfied with *drumMUSTER*
- ?? Farmers have asked for information on chemical disposal

Operations

- ?? Time constraints of collections an issue
- ?? Periodic collections are a deterrent

Eligibility

- ?? *drumMUSTER* should include all farm containers
- ?? Ineligible drums make up 50% of collected drums
- ?? Many dairy containers are ineligible

Key issues

- ?? Farmer education regarding container eligibility and cleaning standards
- ?? Economic container volume required by drum processors for collection
- ?? Inflexibility of collection days/times
- ?? Support from farm chemical retailers

Recommendations

Refer to Recommendations 8, 10, and 11 in Section 2.

9.2 Local Government Councils (that have not signed the *drumMUSTER* service agreement)

Sample size and survey response rate

80 councils that have not signed the *drumMUSTER* service agreement were surveyed and 45 have responded (56%).

Survey findings

Influences on non-participation in *drumMUSTER*

Staff concerns are among the major influences for non-participation of a number of councils with 25 councils (64%) reporting that they had a lack of staff to administer the program, and 18 councils (49%) indicating that they did not have staff who could act as a container inspector (see Table 9.6).

Table 9.6: Influences on non-participation in *drumMUSTER*:

	Yes		No	
	f	%	f	%
Inadequate reimbursement for costs associated with the program	15	42	21	58
Lack of staff to administer the program	25	64	14	36
Lack of a suitable collection site	18	46	21	54
Unable to find a materials recovery contractor (drum processor)	6	18	28	82
Occupational health and safety concerns	14	39	22	61
Don't have staff who could act as a container inspector	18	49	19	51
No time to co-ordinate and run a collection	18	48	20	52
We believe there will be problems dealing with farmers at collections	13	36	23	64
Insufficient containers used in our area to justify a collection	2	6	34	94
Our council was not consulted about <i>drumMUSTER</i>	4	11	32	89
Concerned that farmers in our area are not adequately educated about how to properly rinse empty chemical containers	18	49	19	51
We have concerns about the disposal of collected containers (we don't want to be stuck with them)	20	54	17	46
We already have an established collection and disposal program	4	11	32	89
Exposes council staff to risk in handling chemicals	10	29	25	71
<i>DrumMUSTER</i> is not an important issue or priority for our council	5	14	32	86
Heard reports of unsuccessful collection programs by other councils	6	17	29	83
Our area is remote and we believe there would be logistical problems taking part in the <i>drumMUSTER</i> program	4	11	32	89
We are not convinced that the <i>drumMUSTER</i> program will work	7	19	29	81
We are concerned that farmers who have their containers rejected at a <i>drumMUSTER</i> collection may dump them illegally	22	60	15	40
Collection is an issue for the farm chemical industry and councils should not be involved	13	38	21	62

Respondents were able to indicate more than one answer so total will not equal 100

The issues of disposal of collected containers was raised as an influence for non-participation in *drumMUSTER* by 20 respondents (54%). Similarly the concern that rejected containers would end up being illegally dumped was nominated as a negative influence on participation in *drumMUSTER* by 22 respondents (60%).

Encouragingly for *drumMUSTER*, only 7 councils believed that *drumMUSTER* would not work.

drumMUSTER was viewed as an important issue or priority by 32 councils (86%).

Other reasons for non-participation in *drumMUSTER*

A number of councils (six) indicated that they had not participated in *drumMUSTER* because they were in the process of reviewing or negotiating a regional collection program. One council indicated that their regional waste management group had signed the *drumMUSTER* agreement, and another indicated that they would be investigating *drumMUSTER* during their upcoming waste management review. Other councils were awaiting an agreement between Agsafe and Netwaste¹, and awaiting the finish of a ChemCollect program.

Other reasons nominated are:

- ?? Council's current contractor is not recognised as an inspector by *drumMUSTER*
- ?? Council's liability
- ?? Chemical companies should bear the cost
- ?? Why is it council's problem?
- ?? Need more farmer education regarding container rinsing
- ?? Chemicals should be disposed first, then drums
- ?? Not approached by *drumMUSTER* to participate in the program
- ?? Council surveying farmers prior to making a decision
- ?? *drumMUSTER* service agreement is cumbersome and takes time and effort to process

Intention to sign the *drumMUSTER* service agreement

When asked if council intended signing the *drumMUSTER* service agreement sometime in the future, 33 councils (81%) responded yes. One council indicated that they would sign the *drumMUSTER* service agreement now that constraints have been removed i.e. staffing has been increased and projects have been completed. Only eight councils responded that they had no intention to sign the agreement.

Of the 33 councils (81%) who responded that they intend to sign the *drumMUSTER* service agreement, the majority indicated that they would sign the agreement within the next three months. However nearly one fifth of councils who responded indicated that they were unsure when they would sign (see Table 9.7).

Reasons for not signing the *drumMUSTER* service agreement

The main reasons nominated for not signing the agreement were that a regional waste management group would be signing on behalf of councils, and that council was waiting for the finalisation of an agreement between Agsafe and Netwaste. Other reasons included:

- ?? Industry responsibility
- ?? Insufficient reimbursement
- ?? Inadequate consultation

¹ Netwaste is a Voluntary Regional Waste Management program which has been entered into by 28 local government councils in central NSW. The area covered includes Walgett and Bourke in the north west, Cobar in the west, Lachlan and Bland Shires in the south and Cowra and the Blue Mountains in the east.

- ?? Farmers do not recognise importance of rinsing containers
- ?? Potential problems with shire staff and farmers at collection point
- ?? Other collection centres have been established in the area

Table 9.7: When councils are likely to sign the drumMUSTER Service agreement

Timing	<i>f</i>
Not sure at present	7
Within next 3 months	13
Next 3-6 months	7
Next 6-9 months	4
Next 9-12 months	1
More than 12 months	1
TOTAL	33

Frequency missing = 12

Things that would influence councils decision to sign the agreement

Cost recovery

A major influence to signing the agreement nominated by five of the councils was that of cost recovery. If the program was fully self-supporting with total cost recovery, these councils would be influenced to sign the agreement. One council indicated that overheads need to be factored in to obtain the true cost of running the program.

Removal of containers

Two councils indicated that they would sign the agreement if they were assured that collected containers would be removed.

Regional response

A regional response to waste management was nominated by two of the councils as an influence to signing the agreement. This would include the collection, transport and disposal of cleaned containers.

Farmer involvement

The willingness of farmers to rinse containers properly was nominated by two councils, and general farmer support was nominated by one council, as influences to signing the agreement.

Other influences:

- ?? Removal of liability
- ?? Recognition of drum processor as inspector
- ?? Councils should not be responsible
- ?? *drumMUSTER* inspectors taking full control of inspections
- ?? Regional agreement negotiated with *drumMUSTER* responsible for payments and contractor responsible for inspection of drums
- ?? If the service was not being provided at major centres nearby

Further comments

The councils were invited to include their comments and a detailed listing of responses is contained in Appendix (II).

Key issues

- ?? Council resources available for *drumMUSTER*
- ?? Farmer education about rinsing containers
- ?? Disposal of collected containers by council
- ?? Disposal of rejected containers by farmers (concerned that they will be illegally dumped)

Recommendations

Refer Recommendations 8 and 11 in Section 2.

9.3 Crop Protection and Animal Health retailers

Sample size and survey response rate

280 crop protection and animal health (farm chemical) retailers were surveyed and 119 have responded (43%).

Survey findings

Awareness of the *drumMUSTER* program

The awareness of the *drumMUSTER* program among the surveyed farm chemical retailers was excellent with all respondents reporting awareness. Nearly all (98%) of the retailers reported selling farm chemicals in containers that carry the *drumMUSTER* sticker or logo.

Inclusion of the *drumMUSTER* levy statement on invoices

Nearly three quarters of retailers reported that they included the statement "you have been charged four cents per litre/kilogram on all non-returnable containers which fall under the *drumMUSTER* program". The reasons approximately one quarter of retailers did not include the levy statement include:

- ?? Computer setup does not allow the levy statement
- ?? Some retailers commented that the levy was included until new GST compliant computers were introduced, and the cost of altering computer systems for the levy was too high
- ?? Levy is incorporated into price
- ?? Competitive pressures and lost sales
- ?? Clients refuse to pay the levy
- ?? Levy not charged because *drumMUSTER* program is not operational in area
- ?? Farmer confusion due to different pricing by retailers
- ?? Retailer confusion about which drums are allowable

Level of influence of levy on consumer choice

Of the retailers responding, 59% reported that they did not believe the 4 cent levy would increase the likelihood that farmers would choose a returnable container instead of a non-returnable container. Half of the retailers believed that the levy would influence consumers to choose *drumMUSTER* containers because they are eligible for collection at a *drumMUSTER* site (see Table 9.8)

Table 9.8: Does the 4 cent levy on non-returnable containers carrying the *drumMUSTER* sticker or logo influence consumer choice

	Yes		No	
	<i>f</i>	%	<i>f</i>	%
Will the 4 cent levy increase the likelihood that your customers will:				
Choose a returnable container instead	46	41	65	59
Choose <i>drumMUSTER</i> containers because they are eligible for disposal at a <i>drumMUSTER</i> collection site	52	49	54	51

Respondents were able to indicate more than one answer so total will not equal 100

Promotion of refillable or water soluble packaging

Of the retailers who responded, 63% reported that they actively promoted the purchase of refillable containers (for example, shuttles, Envirodrum, 110L returnable, Agreturns, 55L Wombat and 1000L minibulks). The active promotion of products in water soluble packaging was reported by 60% of retailers.

Promotion of the *drumMUSTER* program

The most common form of promotion of the *drumMUSTER* program used by retailers was face-to-face communication with customers (77%), followed by providing customers with brochures (72%) and the use of posters (66%) (see Table 9.9).

Table 9.9: Promotion of the *drumMUSTER* program by retailers through:

	Yes		No	
	<i>f</i>	%	<i>f</i>	%
The use of posters	75	66	38	34
Providing customers with information brochures	82	72	32	28
Point of sale displays	53	48	57	52
Direct face-to-face communication with customers	88	77	27	23
Informing extension agronomists and veterinarians about the <i>drumMUSTER</i> program	61	55	50	45
Informing customers about when <i>drumMUSTER</i> collections are to be run by your local council	69	64	39	36

Respondents were able to indicate more than one answer so total will not equal 100

Sources of point of sale materials

The largest source of posters and/or point of sale displays for retailers was from *drumMUSTER* (85%), followed by farm chemical suppliers (42%) and local councils (41%).

Almost half of the retailers (48%) were in areas where a *drumMUSTER* collection had been run, but only 38% of these reported receiving promotional material from their local council.

Other sources of posters and/or point of sale displays were reported to come from:

- ?? Rural Co
- ?? Wesfarmers Dalgety
- ?? Department of Primary Industries
- ?? Self made
- ?? Growforce
- ?? *drumMUSTER* update on internet site with IAMA
- ?? Agsafe

A number of retailers commented that no point of sale material has been provided to them.

Further comments

When invited to make further comments about the *drumMUSTER* program more than one third of the retailers participated. A summary of their responses is listed below. (The complete responses are listed in Appendix IV)

Councils:

- ?? Councils in region are not participating in *drumMUSTER*
- ?? Some confusion between *drumMUSTER* and drum recycling programs run by some councils
- ?? Farmer/grower association had to lobby council to get *drumMUSTER* started
- ?? Council believes they will lose money operating *drumMUSTER*
- ?? Problems with council providing information
- ?? Problems with council providing a facility for the implementation of *drumMUSTER*
- ?? Insufficient information regarding *drumMUSTER* collection times
- ?? Councils were slow to be informed about *drumMUSTER*
- ?? Councils were slow to adopt *drumMUSTER*
- ?? Council is slow to reply to questions about *drumMUSTER*
- ?? Councils need more education about *drumMUSTER*
- ?? Councils unwilling to take responsibility for chemical waste due to misunderstandings about storage of drums and chemical wastes

drumMUSTER

- ?? *drumMUSTER* is badly run and organised
- ?? *drumMUSTER* has not changed buying habits in relation to pack sizes
- ?? *drumMUSTER* is a great idea that has been poorly implemented
- ?? Collection sites should have been verified before the start
- ?? Retailers are trying to get *drumMUSTER* started in their area
- ?? *drumMUSTER* is working well
- ?? Clay based products (suspension concentrates) are a problem
- ?? Retailers and farmer/grower associations had to lobby council to get *drumMUSTER* started
- ?? *drumMUSTER* is keeping too much of the levy
- ?? Nearest collection point is too far away - freight cost is prohibitive
- ?? Collection frequency is too low
- ?? Collection hours should be longer
- ?? Low participation rates (even after heavy publicity)
- ?? Cheaper to buy 20L drums than refillables or water solubles
- ?? *drumMUSTER* works better in certain areas, depending on the level of council support
- ?? High degree of inconsistency at container inspections
- ?? No one is accepting responsibility for the promotion of *drumMUSTER*
- ?? Products in non-returnable containers should be more clearly stated

Farmers

- ?? Farmers object to paying the levy when *drumMUSTER* is not available in their area (viewed as a port/tax/money raised for Canberra and the chemical companies)
- ?? Farmers happy to pay the levy if there is a *drumMUSTER* collection facility
- ?? Farmers burn or bury drums
- ?? Farmer confusion that non-returnable means that they cannot be returned to a *drumMUSTER* collection site
- ?? Farmer confusion about drum eligibility
- ?? More information should be provided to farmers
- ?? Farmers purchase behaviour is influenced by brand not packaging
- ?? Farmers buy envirodrums or granular herbicide to avoid paying the levy
- ?? Farmers interested but no *drumMUSTER* program in the area
- ?? Farmers object to the end-user being the only one to contribute to the scheme
- ?? Farmers wish more could be done to reduce the packaging problem
- ?? Farmers would prefer a "one-stop" collection where council would accept all containers and then sort them
- ?? Farmers need more education on acceptable cleaning of drums - if drums are rejected they are reluctant to use *drumMUSTER* again

Retailers

- ?? *drumMUSTER* costs retailer time and money
- ?? Retailer strongly supports *drumMUSTER* however council is not providing the service
- ?? Retailers are carrying the burden and the empty drums
- ?? Some retailers are not charging the levy
- ?? Retailer requests posters and fliers for mailing with statements

Key issues

- ?? The ability of the 4 cent levy to influence purchase behaviour is not clear from this survey
- ?? Non-inclusion of the levy statement on invoices by retailers hinders the transparency of the scheme
- ?? Charging the 4 cent levy in areas where the *drumMUSTER* program is not operating is generating dissatisfaction amongst both farmers and retailers
- ?? Some councils do not provide retailers with information about *drumMUSTER* collection times
- ?? Lack of promotional support from local councils

Recommendations

Refer Recommendations 11, 13 and 14 in Section 2.

9.4 Farmers

Sample size and survey response rate

185 farmers were surveyed and 102 have responded (55%).

Survey findings

Awareness of the *drumMUSTER* program

The awareness of the *drumMUSTER* program among the surveyed farmers was excellent (99%), with only one farmer responding that they were not aware of the program. However, the farmers surveyed were all members of a farmer organisation and this high level of awareness could reflect the level of support be given to the program by those organisations. In another survey conducted among 281 farmers in NW Victoria the level of awareness to *drumMUSTER* was found to be 88% (pers. comm. C Gauchat).

The main sources of information about *drumMUSTER* were newspapers, radio, local councils, chemical retailers, other farmers and direct mail (see Table 9.10). No farmers heard about *drumMUSTER* through the internet.

Table 9.10: Where farmers first heard of *drumMUSTER*:

	Yes		No	
	<i>f</i>	%	<i>f</i>	%
Newspaper	46	45	56	55
Television	7	7	95	93
Radio	34	33	68	67
Advice from chemical retailer	33	32	69	68
Direct mail	24	24	78	76
Local council	34	33	68	67
Internet	0	0	102	100
Other farmers	31	30	71	71

Respondents were able to indicate more than one answer so total will not equal 100

Important sources of information about *drumMUSTER* were the various farmer/grower associations, in particular the Canegrowers Association, South Australian Farmers Federation and the Victorian Farmer Federations.

Other farmer/grower associations mentioned were, NSW Farmers Association, NFF, WA Farmers Federation, Agforce and Cotton Growers Association.

Other sources of information about *drumMUSTER* mentioned were the levy statement on invoices, Farm Weekly and Countryman magazines.

The Queensland Farmers Federation provides information about *drumMUSTER* on its Internet web-site (www.qff.org.au)

Ever purchased containers carrying the *drumMUSTER* sticker or logo

The majority of farmers (86%) have purchased farm chemicals in containers carrying the *drumMUSTER* sticker or logo, with 4% reporting that they had never purchased *drumMUSTER* containers and 10% reporting that they were not sure.

Farmer awareness of paying *drumMUSTER* levy

Only 12% of farmers were not aware that they were paying a levy when purchasing farm chemicals in containers carrying the *drumMUSTER* sticker or logo.

Influence of *drumMUSTER* levy on farmer purchase behaviour

When farmers were asked whether the 4 cent levy on non-returnable containers carrying the *drumMUSTER* sticker or logo would increase the likelihood that farmers would choose a returnable container, half of them responded yes. Similarly, approximately half of the farmers responded that they thought the levy would influence them to choose *drumMUSTER* containers because they are eligible for disposal at a *drumMUSTER* collection site.

Table 9.11: Does the levy increase the likelihood that farmers will:

	Yes		No	
	<i>f</i>	%	<i>f</i>	%
Choose a returnable container instead	45	51	43	49
Choose <i>drumMUSTER</i> containers because they are eligible for disposal at a <i>drumMUSTER</i> collection site	49	56	39	44

Respondents were able to indicate more than one answer so total will not equal 100

Level of participation in *drumMUSTER* collections

When asked whether they had ever disposed of empty farm chemical containers at a *drumMUSTER* collection site 50% of farmers responded yes. Around 58% of farmers surveyed had a *drumMUSTER* collection in their area and of these, 80 % reported disposing of containers at the collection site.

Level of satisfaction with *drumMUSTER* collections

Of those farmers that participated in *drumMUSTER* collections 70% were satisfied, 18% were somewhat satisfied, and 12% were dissatisfied with the program.

Reasons for dissatisfaction with the *drumMUSTER* program

The major reason for dissatisfaction with the *drumMUSTER* program is that it is not offered by a number of councils. Farmers are angry that they are being charged a levy and not receiving any service in return. A number of farmers also find it difficult to participate in *drumMUSTER* collections because of limited operational hours, the need to travel long distances to a *drumMUSTER* site and the cost of transportation.

Other reasons for dissatisfaction with *drumMUSTER* are:

- ?? The variation of cleanliness standards at inspections
- ?? Some chemicals are not available in returnable containers of *drumMUSTER* containers and farmer has no choice when purchasing them
- ?? Chemical manufacturers should be encouraged to supply retailers in bulk to allow drums to be recycled on farms.

Only 7% of farmers who disposed of containers and had a *drumMUSTER* collection site in their area were dissatisfied with the program.

Promotion of the *drumMUSTER* program by farm chemical retailers

Nearly one half of farmers (49%) responded that there was no promotion of the *drumMUSTER* program by farm chemical retailers. Many farmers (24%) did not know whether their farm chemical retailer promoted *drumMUSTER* and 27% of farmers said that their retailer did promote *drumMUSTER*.

Of those farmers with a *drumMUSTER* collection site in their area only 38% report that retailers promote *drumMUSTER*, 43% report that they don't and 19% did not know.

Farmer education in rinsing practices and management of farm chemical containers

A majority of farmers have received information about proper rinsing practices (85%), the use of safer emptying and rinsing devices (67%) and the management of farm chemical containers in an environmentally friendly way (81%) (see Table 9.12).

Table 9.12 Information received by farmers over the last couple of years

	Yes		No		Don't Know	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Proper rinsing practices	82	85	13	13	2	2
The use of safer emptying and rinsing devices	63	67	27	28	4	4
The management of farm chemical containers in an environmentally friendly way	75	81	17	18	1	1

Respondents were able to indicate more than one answer so total will not equal 100

Farmer attendance at training courses

Farmers are reporting a high level of training with 91% responding that they have attended a training course in the use of farm chemicals.

Management of empty non-returnable containers

Only 39% of the farmers who responded reported that they usually dispose of their drums at a *drumMUSTER* collection site. There is a discrepancy between the response to this question and the earlier question about whether farmers had ever disposed of containers at a *drumMUSTER* collection site (49.5%). The inconvenience of the limited *drumMUSTER* hours of operation in some areas and the long distances that some farmers have to travel to a *drumMUSTER* collection site are some of the reasons for this lower than expected participation in *drumMUSTER* collections.

The other ways in which empty non-returnable farm chemical containers are managed are:

- ?? Use them as storage containers (40%)
- ?? Disposal at a local Shire or Municipal rubbish tip (40%)
- ?? Store them on the farm (36%)
- ?? Burn them (28%)
- ?? Bury them (17%)

Table 9.13 What farmers usually do with empty non-returnable farm chemical containers

	Yes		No	
	<i>f</i>	%	<i>f</i>	%
Give or sell them to a drum dealer or contractor	9	9	93	91
Dispose of them at a local Shire or Municipal rubbish tip	41	40	61	60
Return them to the retailer who sold them	6	6	96	94
Have them picked up by the dealer who sold them	3	3	99	97
Use them as storage containers	41	40	61	60
Put them in a farm rubbish tip	24	24	78	76
Bury them on the farm	17	17	85	83
Burn them	29	28	73	72
Store them somewhere on the farm	37	36	65	64
Dispose of them at a drumMUSTER collection site	40	39	62	61
Dispose of them through other recycling facilities/depots	9	9	93	91

Respondents were able to indicate more than one answer so total will not equal 100

Further comments

When invited to make further comments about the *drumMUSTER* program approximately one quarter of the farmers participated. A summary of their responses is listed below. (The complete responses are listed in Appendix IV)

Levy

?? Charging a levy and not receiving a service is a disgrace

?? Farmer avoids buying *drumMUSTER* containers due to levy charge with no *drumMUSTER* collection site available

Farmer knowledge of *drumMUSTER*

?? Some farmers admit that they have little knowledge about *drumMUSTER* and whether it operates in their area

?? Farmer does not understand what the *drumMUSTER* sticker means (who collects the containers, how will containers be delivered)

Council

?? Council had to be pressured to set up *drumMUSTER* service

?? Farmer believes that *drumMUSTER* will be a cost to farmers as council's will incur a cost to provide the service

***drumMUSTER* program**

- ?? *drumMUSTER* is working well - please ensure that it continues
- ?? *drumMUSTER* is a much needed service
- ?? Clean rinsing specifications are difficult to meet, especially with chemicals that leave residues and marker fluid dye containers
- ?? Many farmers unaware of the need to make an appointment and have been turned away
- ?? *drumMUSTER* is not working - we incinerate our drums
- ?? Limited operational hours are inconvenient
- ?? *drumMUSTER* site is too far away

Key issues

- ?? Farmer confusion about the *drumMUSTER* program (including the role of the levy)
- ?? Lack of promotion of the program by farm chemical retailers
- ?? Perception by some farmers that the levy is a tax
- ?? Inconvenience of *drumMUSTER* collection operation times

Recommendations

Refer Recommendations 8, 11, 12 and 12

9.5 Drum processors

Survey questionnaires were sent to all 13 drum processing contractors who were accredited with *drumMUSTER* at the time of the review. One processor has two operational sites, one in WA and one in Victoria and survey questionnaires were sent to both sites.

One processor had only just received approval and had not undertaken any work for the program and therefore did not respond to the survey. Two of the processors did not respond.

The responses discussed below are from 11 processors.

Survey findings

The survey answers are summarised in Table 9.14.

Table 9.14 Responses from Drum Processing Contractors

Question	Response	No.
Do you see your drum processing business for the <i>drumMUSTER</i> program as being a viable long-term business arrangement?	yes	4
	no	4
	don't know	3
Does your drum processing business for the <i>drumMUSTER</i> program provide your business with satisfactory financial returns?	yes	2
	no	5
	don't know	4
Do you have adequate access to markets for processed plastic?	yes	8
	no	3
Do you have adequate access to markets for processed steel?	yes	8
	no	3
Do you see the market for processed plastic containers as being viable in the long term?	yes	6
	no	1
	don't know	4
Do you see the market for processed metal containers as being viable in the long term?	yes	7
	no	3
	don't know	1
Have you encountered any problems processing the returned containers?	yes	2
	no	9
Have you encountered any problems dealing with the Councils?	yes	5
	no	6
In terms of your processing business, could the operation of <i>drumMUSTER</i> be improved?	yes	5
	no	5

Viability of processing for drumMUSTER

Only 4 of the respondents believe that processing for *drumMUSTER* is a viable long-term business and only 2 reported receiving satisfactory financial returns. Those that did not know have not had sufficient processing experience to make these judgements.

It should be noted that the volume of containers processed in the 12 months ending 30 September 2000 was around 880 tonne and if the objectives of the collection program are achieved this volume would increase to around 5,000 tonne. The processor involved with collection, reconditioning and resale of non-returnable containers reported that, to date, the *drumMUSTER* collection programs had not increased the volume of containers being returned to them.

It seems reasonable to assume that with increasing numbers of councils participating which should result in larger numbers of containers available for re-use and recycling, the financial outlook for the drum processing operations should improve.

Markets for processed containers

There is adequate access to markets for both plastic and steel containers. However, several processors have noted, either in their survey responses or in follow-up telephone interviews that while they have access to markets for steel, the returns they obtain are inadequate. Although it is beyond the scope of this review to investigate in detail the market for processed containers, it would appear that returns of the order \$400 per tonne of processed plastic are obtainable compared to only \$60 for steel.

Some processors realise that markets are potentially available but these are interstate and from their point of view regarded as impractical to access.

Most processors believe that the markets for both processed plastic and steel are viable in the long-term.

One processor with processing plants in Victoria and Western Australia is involved in the recovery and re-conditioning of non-returnable containers for re-use by manufacturers.

Processing containers

Only two respondents reported problems or difficulties in processing containers. In one case, the problem was not so much in the processing as such, but with the design of the fenced, secure, enclosure where collected containers are stored while awaiting the arrival of the drum processor. It was stated that the enclosure restricted movement and resulted in increased processing time and therefore costs. Another processor reported that a potential recycling client had rejected drums that had been properly rinsed and inspected and were clean, because chemical residues (unspecified) were detected in the sample submitted to the client for testing.

A supplementary survey of drum processors process by telephone and facsimile contact was undertaken late in the review when it became apparent that the lack of information on the disposal route of collected containers was an important data gap. Eleven processors responded. Ten confirmed that all containers removed by them were used for recycling purposes either for re-use or manufacturing. One processor advised that all the plastic and 40% of the steel containers were recycled for manufacturing and 60% of the steel containers were landfilled. None reported use as a fuel.

Problems encountered with Councils

Several respondents reported problems in their dealings with Councils. The main complaint is that Councils are not using their services for one of the following reasons:

- ?? The Councils prefer interstate operators.
- ?? The Councils are using processors not approved by *drumMUSTER*.
- ?? Councils won't start *drumMUSTER* collections because they perceive that it will involve dealing with chemicals.
- ?? Councils are preferring to bury containers at their landfill rather than dispose through *drumMUSTER*.

One respondent reported that some Councils allow drums that are eligible for re-use to be granulated rather than retained for forwarding on to DSL Drum Services.

One respondent reported delays in obtaining payment apparently because of inefficiencies and delays in processing their account and sometimes because the Council payments officer was not aware that the account was to be paid in 7 days as opposed to 30 days.

Suggested Improvements

The following comments and suggestion were made by respondents:

- ?? The proportion of the levy being made available for drum processing is too small.

- ?? There is a perception that the levy gets used up in “jobs for the boys” and not much is used for the original purpose of the scheme.
- ?? Collections should be operated in a way to make it easier for drums to be returned rather than discouraging the return of drums.
- ?? Greater use should be made of re-useable containers.
- ?? The volume available for processing is too small.
- ?? Lack of financial assistance to purchase plastic granulation equipment.
- ?? Long delays in obtaining *drumMUSTER* approval (4 months).
- ?? Councils should cooperate so that adjoining areas could run programs at the same time.
- ?? There is not sufficient accountability by *drumMUSTER* to those that pay the levy.
- ?? Concerns over the increasing transport costs in more remote areas.

Key issues

- ?? The overall viability, operating efficiency and profitability of drum processing appear to be in question. (However, this should change with increased numbers of collected containers that should flow on from greater participation by councils in the *drumMUSTER* program).
- ?? Uneconomically low volumes of containers available for processing
- ?? The relatively poor returns obtained from recycling steel containers.
- ?? *drumMUSTER* is not assisting the re-use scheme run by DSL Drum Services.
- ?? Access to recycling markets may be inhibiting the processors

Recommendations

Refer Recommendations 4, 5, 6, 7 and 10.

10. *drumMUSTER* — PERFORMANCE AGAINST OBJECTIVES

Increasing the participation of councils

Number of Councils with drumMUSTER Service Agreements

Agsafe advise that as at 1 October 2000 they have entered into 223 service agreements with Councils and other collection agencies.

Agsafe have been advised by the *drumMUSTER* Advisory Council to concentrate its efforts on signing up those Council designated as Priority Councils. These are Councils that have estimated annual drum sales greater than 2,000 in their region. Details are set out in Table 10.1.

Table 10.1 Number of service agreements and collections

State	Council Services Agreements						Councils running collections	
	All councils			Priority Councils			Number of Councils	Number of collections
	Number signed	%	Total number	Signed	%	Total number		
NSW	54	31	176	43	50	86	34	75
VIC	33	42	78	29	71	41	21	95
QLD	55	44	125	36	60	60	23	58
SA	38	55	69	35	88	40	26	74
WA	35	24	144	28	39	71	13	22
TAS	8	28	29	2	25	8	2	2
NT*	0	0	9	0	0	n/a	0	1
Australia	223	35	630	173	57	306	119	326

*Note: Northern Territory collections were run in conjunction with the WA Department of Land Planning & Environment when they conducted collections in the Kimberley region of WA.

Future plans to improve Council participation

Agsafe advise that they now have adequate people resources in place and expect 75% of priority councils to sign service agreements by December 2000 and 95% by June 2001.

No estimate is currently available in relation to Councils that do not fall into the Priority category.

The appointment of State Coordinators for Western Australia and South Australia is achieving expected outcomes. In SA almost every Priority Councils has now entered into an agreement with *drumMUSTER*. WA has been slower but indications are that progress is now being made and it is only a question of time before their Priority Councils are signed up.

There were some delays in NSW resulting from negotiations with Netwaste, the Voluntary Regional Waste Management group of 28 councils in Central NSW and the Moree Plains Shire (the latter is estimated to have the largest usage of crop protection and animal health products of any local government area in Australia). Agsafe advise that arrangements are now proceeding with both Netwaste and Moree Plains Shire.

Reducing the amount of container waste going to landfill

The stated objective of the IWRS is to reduce the weight of non-returnable containers going to landfill by 66% by 2001. The current information collected by Agsafe from councils running collections or

through the drum processor approval process does not identify and quantify the various disposal routes being used for processed containers. (See Recommendation 7).

In regard to the weight of containers collected, Table 7.2 on page 21 shows that in the 12 month period 1 October 1999 to 30 September 2000 the *drumMUSTER* program collected 10% of the containers sold in 1999 (after allowing for those non-returnable containers collected in re-use programs).

It must be recognised that the *drumMUSTER* collection program experienced delays is only emerging from its start up phase.

The first *drumMUSTER* collection was undertaken in May 1999 and to the beginning of October 2000 *drumMUSTER* collections total 805 tonne (approximately 590,000 containers).

Given that the program is just moving into its second year, the issue is, how can the *drumMUSTER* progress be assessed.

One way to assess the progress is to benchmark it against the rate of progress of container collection program in North America which have been in operation since the late 1980s.

Canada

In Canada the Crop Protection Institute commenced collection programs in 1989. The program involves collection, shredding and recycling of empty containers. However, unlike the *drumMUSTER* program there has been no requirement for only rinsed container to be collected and there is no inspection step involved. In 1996 the cost for the total program was equivalent to £Stg 1,220 per tonne of plastic collected (Cook 1998). At today's exchange rate that is equivalent to approximately 18 cents (Australian) per litre of product in a 20L container (weight 1.2 kg). Some plastic is recycled to make fence posts while the balance is used for its fuel value.

In its first year the Canadian program recovered an estimated 700 tonne of containers. By 1996 the recovery level had reached 64% (Cook 1998) and the total weight of plastic recovered in 1996 was 1,354 tonne.

USA

Collection programs began on a pilot basis in 1989 and an industry program was established in 1992. The USA program required delivery of rinsed containers and an inspection step was put in place. In 1997 the cost for the total program was equivalent to £Stg 640 per tonne of plastic collected (Hutton 1998). At today's exchange rate that is equivalent to approximately 10 cents (Australian) per litre of product in a 20L container (weight 1.2 kg). Some plastic is recycled for its fuel value but an increasing amount is being used for manufacturing end-uses such as industrial pallets and field tiles. In the first year of the industry run program (1991) they collected 581 tonne of plastic and by 1996 this had grown to 2,723 tonne (Hutton 1998).

Judged by these international benchmarks it can be concluded that the *drumMUSTER* program has made favourable progress since collection programs began.

Cooperation with the packaging recycling industry

As noted elsewhere in this report there has been no information provided to the review of the extent of cooperation or liaison with the packaging recycling industry. (see Recommendations 5 and 6).

Improving Occupational Health and Safety Practices

One of the objectives of the IWRS was for the industry to ensure all Agsafe accredited premises carried promotional point-of-sale brochures and posters which promote proper rinsing practices. Based on the responses from retailers and farmers this objective has not been achieved. (see Recommendation 9).

11. *drumMUSTER* — EFFECTIVENESS OF DELIVERY MECHANISM

Agsafe Limited is a subsidiary of Avcare and was set up to administer and deliver safety programs, as well as environmental and accreditation schemes on behalf of the crop protection and animal health industry. It is also responsible for implementation of the *drumMUSTER* program.

The effectiveness of the *drumMUSTER* program is highly dependent on the effectiveness of each link in the overall supply and recovery/recycling chain, (see Figure 11.1, below)

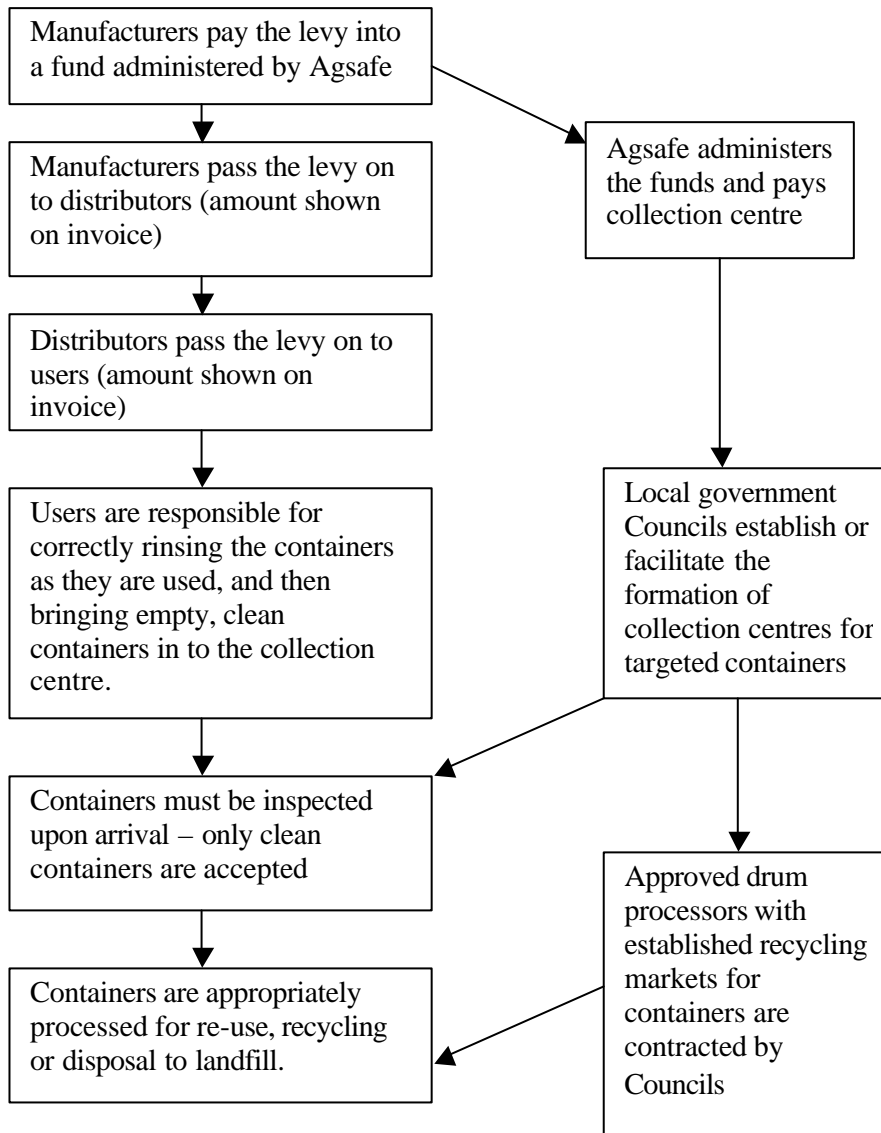


Figure 11.1: Supply, recovery/recycling chain for Industry packaging waste.

To enable manufacturers to pay a levy and pass this onto distributors and retailers application was made to the Australian Competition and Consumer Commission. The ACCC gave its authorisation to the arrangement in November 1998.

11.1 Participation by Manufacturers

All Avcare Members who sell crop protection and animal health products are participating in the *drumMUSTER* program and this includes those members of VMDA who have cross membership of both organisations.

Most of VMDA's members who supply on-farm animal health products are members of Avcare. However, there are no statistics available to show whether there are VMDA members who supply on-farm animal health products in containers greater than 1L or 1kg that are not participating in the *drumMUSTER* program.

There are several significant importers of crop protection products who are not members of Avcare and who are not participating in the *drumMUSTER* program. Some of these companies purchase reconditioned 20L plastic containers from DSL Drum Services. Based on information supplied by DSL and on the Avcare Container Audit information, it is estimated that these companies purchased 16,000 twenty litre plastic containers in 1999.

Interest in becoming involved in *drumMUSTER* has been expressed by non-Avcare and non-VMDA members. Agsafe has established a process whereby these organisations can become involved without the need for each to become a separate signatory to the IWRS. This has been submitted to ACCC and interested parties are currently being consulted. (see Recommendation 2)

Payment of levy to Agsafe

The IWRS specifies that Avcare must require its members to impose a levy and require its members to make available for Agsafe's inspection such records to satisfy Agsafe that amounts paid are correct. VMDA must encourage its members to do the same.

Agsafe advise that suppliers are meeting their obligations, and that a levy collection system to initiate and track levy payments is in place. However, to date, there has been no independent audit of any participant. (see Recommendation 3)

Manufacturers charging the levy to distributors

It has been assumed that all Avcare and VMDA members who participate in the scheme are passing the levy onto their distributors or retail customers and showing this on their invoice.

11.2 Participation by crop protection and animal health distributors and retailers

Retailers were seen to have an important role in the program. Retailers are subject to an industry accreditation and training scheme administered by Agsafe and were envisaged as having a key role in several aspects of the *drumMUSTER* program:

- a) Passing the *drumMUSTER* levy onto farmers and showing the amount on the invoice.
- b) Providing information and advice to users on correct rinsing and cleaning of containers.
- c) Providing customers with information about *drumMUSTER* collections in cooperation with local collection centres.

Passing the drumMUSTER levy onto farmers and showing the amount on the invoice

Twenty seven percent of the retailers surveyed for this review do not show the *drumMUSTER* levy on their customer invoices.

There are a number of reasons given by retailers and these are discussed in Section 9.3. Whatever the reasons, the impact in the longer term may well reduce the level of transparency of the levy arrangement and the impact on user awareness of the *drumMUSTER* program.

Providing information and advice to users

The proportion of retailers who promote *drumMUSTER* with in-store material and through face-to-face communication varies from 65% to 75% of respondents.

Providing customers with information about drumMUSTER collections

Sixty four percent of retailers reported that they promote the timing of *drumMUSTER* collections to their customers. However, as noted elsewhere in this review, 38 % of farmers with *drumMUSTER* collections in their area report that retailers in their area did not promote *drumMUSTER*.

There is a need for the crop protection and animal health industry to achieve a greater degree of involvement from their retail outlets in the promotion and educational aspects of proper rinsing, cooperation and liaison with local councils and in supporting *drumMUSTER* promotions. (See Recommendation 13 in Section 2).

11.3 Participation by farmers

The limitations of time and budget for this review did not allow the level of participation by farmers in the *drumMUSTER* program or their container rinsing practices to be adequately investigated.

There are no current accurate estimates of the number of single trip drums delivered in council areas running collections.

It was not possible to obtain a large enough or representative sample of farmers that would have enabled an accurate estimate to be made of the participation rate of farmers in areas in which collections were made. However, in the farmers surveyed there was an 80% participation rate in areas where *drumMUSTER* collections were run.

With regard to rinsing practices, the level of rejection of containers at collection sites is some measure of the degree to which farmers are properly cleaning and rinsing their containers.

In the National Survey of Farmers (McGuffog et al 1995), 8% of farmers reported not rinsing containers with a significant degree of variation between farm sectors e.g. in the livestock sector 15 % of producers did not rinse whereas in the grain, cotton and sugar sectors the level of non-rinsing was of the order 2.5 to 5%.

Additionally the survey found that only 4% of farmers who had undertaken training in the use of farm chemicals did not rinse containers. Since 1994 the number of farm chemical users who have undertaken training has expanded significantly to more than 100,000.

A detailed analysis of the farmers who reported that they did not rinse containers was undertaken by two of the authors of the National Survey of Farmers (Turrell G. and McGuffog I.D). The analysis found that non-rinsing was significantly predicted by the following variables: no formal training in the use of crop protection and animal health products, being a livestock producer, having no additional adults permanently employed in production activities on the farm, having a tertiary education, operating a farm of greater than 3,500 hectare, not perceiving that rinsing containers is important, and not believing that chemical residues in containers were a threat to the environment.

According to Agsafe's information derived from information supplied by Councils conducting collections, the overall rejection rate was put at 5%. However at several collection sites there have been rejection rates in excess of 10% and some as high as 60%. In the survey conducted as part of this review councils reported rejection rates varying from 0% to a more than 50%. But nearly two-thirds reported that rejection rates were only 0-5%.

Agsafe have reported that difficulties are being experienced by farmers when rinsing suspension concentrate formulations. These difficulties have been mentioned by respondents to the surveys undertaken for this review.

Based on this limited data it would appear that additional efforts are needed to bring rinsing compliance closer to an acceptable level across all users. (see Recommendation 12 and 13 in Section 2).

11.4 Participation by Local Government

It has been acknowledged by all parties to the IWRS and Agsafe that the *drumMUSTER* establishment phase was more difficult than anticipated and took much longer than expected.

There was a lag phase which was required to set up the contract infrastructure, council and training manuals and inspector training. Initially, it is considered that the program did not have sufficient people resources for a more rapid and effective implementation.

There is no doubt that the delay and initial difficulties in establishing collection centres have contributed to a high level of dissatisfaction by farmers in areas where *drumMUSTER* collections are not available. (See Recommendation 11 in Section 2).

11.5 Drum processing and recycling

The *drumMUSTER* program is heavily dependent upon the availability of contractors who can process drums for recycling, or if this option is not available, for landfill in a reduced form (crushed or granulated).

In addition, the availability of a number of contractors should ensure that a competitive market exists for this step. Processors are paid a fee by Councils, within limitations agreed between the Council and Agsafe, and also sell the processed material into the recycling market where the material is used in the manufacture of products.

Steel drums are normally crushed and then transported to a metal recycling or smelting centre. Plastic drums may either be retained without further processing for forwarding to DSL Drum Services if they are single trip 20L drums included in these re-use programs or granulated and the plastic sent to a processor for re-extrusion as a new product.

So far 13 Contractors have been accredited by Agsafe.

The overall availability and performance of drum processing contractors appears to be generally satisfactory. The performance of some contractors is of concern to some Councils as outlined in Section 10.1 detailing the results of the Survey.

The survey results discussed in Section 9.5 indicates that most processors have concerns about the long term viability of their operations for *drumMUSTER* and the financial returns from this business.

11.6. Assessment of effectiveness of *drumMUSTER* as a delivery mechanism to achieve the IWRS Strategic Objectives

The evidence and information gathered for this review clearly demonstrates that the *drumMUSTER* program is an effective mechanism for achieving the objectives of the IWRS dealing with collection and disposal of empty containers.

Although no quantitative data was available from existing records a supplementary survey of drum processors confirmed that all plastic containers were going into recycling purposes either for re-use or manufacturing. Only one processor reported a proportion of steel containers that they had processed (60%) were landfilled.

Even among those farmers and retailers who are critical of *drumMUSTER* there is a high level of support – their criticism is that no collection programs are in place in their areas.

There is compelling evidence from the rate of new applications from Councils for service agreements with *drumMUSTER* and from the survey conducted for this review, that the vast majority of Councils will sign up over the next 6-9 months.

There is no doubt that where the issues that were inhibiting Council participation have been addressed, and a program was subsequently established, there is a high level of satisfaction with the outcome.

drumMUSTER is a very major undertaking and nothing like it has been attempted before in Australia by any other industry (or indeed in other countries that have introduced collection programs such as the USA and Canada where the programs are funded and run by the crop protection industry).

Unlike all other waste collection/recycling programs for non-hazardous materials, *drumMUSTER* collections must have an inspection step to ensure that the containers are non-hazardous waste.

While there have been problems in the start-up phase and there is no doubt scope for improvements in the delivery and coordination of the program it is clear from the achievements to date and the feedback obtained for this review that *drumMUSTER* is an effective mechanism for achieving the objectives of the IWRS.

12. *drumMUSTER* — EFFECTIVENESS OF LEVY MECHANISM AND INFLUENCE ON CONSUMER CHOICE

There would appear to be two major potential influences of the levy mechanism on consumer choice:

- a) The levy and *drumMUSTER* logo identifying for the user that the container has a defined disposal route.
- b) The levy influencing the user to avoid purchasing a product with a logo to avoid the 4 cent levy.

It would require a much wider ranging and representative survey of farmers attitudes to make any definitive judgement on the impact of the levy and identifying logo on consumer choice.

However, based on responses to the Surveys conducted for this review around half the retailers think that the *drumMUSTER* levy influences customer choice and a similar proportion of farmers surveyed are of the same opinion.

Perhaps of greater importance, is the fact that among the farmer sample there is a very high awareness of the *drumMUSTER* program.

In addition 88% of farmers surveyed were aware that they were paying a levy.

The Surveys conducted for this review have demonstrated that in areas where no *drumMUSTER* collection was available, this level of awareness has created significant tensions between farmers and their suppliers and their local Council. It seems likely that this tension has had a positive effect in terms of providing motivation for all parties to resolve whatever constraints there were to establishing a collection program.

From the evidence available it is reasonable to conclude that:

- a) The levy is serving its intended purpose in providing funding for programs to implement the objectives of the IWRS
- b) The levy has been an effective vehicle for raising user awareness of the *drumMUSTER* collection program.

13. ADEQUACY OF DATA

13.1 Historical Data

Industry waste reduction programs established through negotiations between government regulatory agencies and industry during the 1990s had mostly been based on the premise of reduction targets on a 1990 base year.

There is no quantitative data available on the amount, or proportion of waste from the crop protection and animal health industry going into various disposal or usage streams in 1990.

The National Survey of Farmers conducted for Avcare provided valuable qualitative and quantitative data on container disposal methods used by farmers, but did not attempt to collect quantitative data on the volume going into the various disposal methods adopted.

Fortunately, Avcare commenced regular audits of container usage in 1991 and these have continued every two years since then. This information has provided adequate quantitative data on national packaging trends, as well as measure the achievement of the targeted reduction in packaging reaching the national market place.

However, there is no reliable quantitative data which measures the usage of crop protection and animal health product containers on a regional or shire basis.

McGuffog & Co in 1993 obtained, on behalf of Avcare, an unpublished data set from the Australian Bureau of Statistics Farm Census for 1990-91 which provided information at the local government statistical area on the volume of usage of herbicides, insecticides, fungicides, dips and drenches in liquid and solid form. The data were never published by ABS. However, by examining and making corrections to anomalies in the data and then comparing the total volume predicted with the 1991 Avcare container audit volume, it was possible to develop a model which gave a basis for allocating container usage down to a shire level. This model has been used as a basis for estimating container usage by shire by incorporating subsequent container audit data in the model.

The usefulness of this model is now limited because of the significant changes in land use and changes in types and application of crop protection and animal health products over the past decade. (see Recommendation 1)

13.2 Current Data

Container Audit

Information provided by Avcare from its audits of the number of containers sold, has been an adequate source of data for the purposes of this review at a national level.

However, the Avcare data does not provide information about container usage at a regional or shire level. For future assessments of the effectiveness of the *drumMUSTER* it would be desirable to have quantitative data at least at regional statistical area levels to assess the percentage of container waste that is recovered by the *drumMUSTER* program.

The VMDA do not undertake container audits of their members although most of their members supplying to farmers are also members of Avcare and their container usage is picked up in the Avcare audit.

No information is available on the container usage of importers and manufacturers who are not members of Avcare or VMDA.

The industry has not established individual company information gathering systems to enable measurement of the targets for recycling and re-use of packaged raw materials used in the manufacture and formulation of crop protection and animal health products.

drumMUSTER Collection

Agsafe use a database to capture information from the Council claims for funding of *drumMUSTER* collections. This provided an adequate source of data for the purposes of this review in relation to the amount of packaging collected at both the national and regional level.

Agsafe approves the drum processors contracted by councils for *drumMUSTER* collection programs and a condition of approval is that the processor has access to recycling markets for processed containers. However, there is no data available on the actual use of the containers processed and removed by the drum processing contractors. To fill this information gap a supplementary survey of drum processors was undertaken to find out the disposal route for the processed container waste removed by processors.

A system for monitoring the disposal route for collected containers should be established. (see Recommendation 7).

Survey data

As part of this review, surveys were administered to four key stakeholder groups: (i) local government councils that had run collections (n=80); (ii) local government councils that had not signed the *drumMUSTER* service agreement (n=80); crop protection and animal health retailers (n=280); and (iv) farmers (n=185).

Given time and resource constraints it was not possible to collect data from a statistically representative sample of each of these groups. For the same reasons, it was not possible to implement a survey "follow-up" strategy with the aim of reminding members of each group to return their surveys, thus the response rates for each group are not high (64%, 56%, 43%, 55% for groups i-iv respectively). As a consequence, it is likely that the returned data harbour biases, although the nature of these remain unknown (or can only be guessed at).

Further, the sample of farmers was selected from members of farmer organisations, thus the survey responses from this group do not necessarily reflect the views of the broader farming community. Each of these caveats about the scope and coverage of the samples needs to be considered when interpreting the results of the surveys.

14. STAKEHOLDER SUBMISSIONS

Organisation	Comments
<i>Tasmanian Farmers and Graziers Association</i>	?? Councils have been reluctant to participate in <i>drumMUSTER</i> .
	?? Tasmania only has priority 3-5 councils so it is not a priority for <i>drumMUSTER</i> .
	?? Classification of priority councils should compare purchases per capita to get a real picture.
	?? Farmers annoyed at paying for the service and not receiving it.
	?? Farmers are lobbying council members.
	?? Considering accessing the funding and undertaking a mobile service.
<i>Department of Primary Industries, Water and Environment (TAS)</i>	?? <i>drumMUSTER</i> program only established in June 2000, too early to assess the impact of the program.
	?? Aware of only six out of 29 councils currently signed.
	?? Levy paying farmers are unhappy with councils that have not signed.
	?? Confusion by people exists between ChemCollect and <i>drumMUSTER</i> .
	?? More effort could be put into promoting councils that have signed up in those areas where councils do not want to participate in the <i>drumMUSTER</i> program.
<i>Local Government Association of South Australia</i>	?? <i>drumMUSTER</i> seems to be working well, after overcoming initial administrative and process issues with SA Councils.
	?? The LGA developed a 'Services Agreement Package' for councils which included proforma letters to the EPA and the SA Local Government Mutual Liability Scheme.
	?? The appointment of a part time project coordinator for SA seems to have helped.
<i>Environment Protection Agency (SA)</i>	?? Fully supports the principle and operation of <i>drumMUSTER</i> .
	?? Co-operates with the local representative to ensure the program is a success.
	?? Officers of the EPA have attended at collections, and view them as worthwhile in that they provide an opportunity for farmers to properly manage the containers whilst reducing the demands on landfill.
	?? Employment of a South Australian coordinator has improved the council participation rate and the general acceptance of the <i>drumMUSTER</i> scheme.
<i>Environment Protection Authority (VIC)</i>	?? Supports the objectives of the <i>drumMUSTER</i> program.
	?? Concerned about reported incidents of drums being left at collection points outside of collection times.

Organisation	Comments
<i>Department of Natural Resources and Environment (VIC)</i>	?? Department is fully supportive of <i>drumMUSTER</i> , recognising it as an excellent example of initiative in industry self-regulation.
	?? <i>drumMUSTER</i> is successful in the north of the state, however most councils in the southern region seem unwilling to embrace the program.
	?? Frustration experienced by chemical users in southern regions due to non-establishment of the program whilst still paying the levy.
	?? Appointment of a coordinator for South East Victoria would assist Shires and Councils in that area.
	?? Departmental staff have tried to assist the implementation of the program by facilitating meetings between Shires/Councils and by communicating the program throughout chemical networks.
	?? <i>drumMUSTER</i> appears to require more support from industry at the local level.
<i>Department of Environmental Protection (WA)</i>	?? Department involved with <i>drumMUSTER</i> throughout north-west of Western Australia and the Northern Territory in conjunction with ChemCollect program.
	?? Departmental staff were trained as <i>drumMUSTER</i> inspectors.
	?? The majority of containers did not pass the <i>drumMUSTER</i> inspection. They were subsequently cleaned to conform to <i>drumMUSTER</i> requirements.
<i>Environmental Protection Agency (QLD)</i>	?? <i>drumMUSTER</i> is well supported by some councils and viewed negatively by others.
	?? Negativity by councils is driven by the perceived cost to the council in terms of people and resources.
	?? EPA promotes <i>drumMUSTER</i> as an important component of the IWRS while ChemCollect is operating.
<i>Department of Primary Industries (QLD)</i>	?? Department supports the principles of the <i>drumMUSTER</i> program and has followed its progress with interest.
	?? <i>drumMUSTER's</i> potential to facilitate the recovery of a significant number of non-returnable empty pesticide containers for recycling is consistent with the goals of DPI's responsible chemical use initiatives.
	?? A thorough quantitative assessment of the program against the objectives of the IWRA is needed.

Organisation	Comments
<i>Department of Primary Industries (QLD) (cont.)</i>	<p>?? A "Mass Balance" of containers distributed and collected is required to assess the effectiveness of a particular collection and ultimately the overall effectiveness of <i>drumMUSTER</i>.</p> <p>?? This would identify areas where relatively large numbers of containers are distributed compared with that collected. These areas could then be targeted by <i>drumMUSTER</i> with a view of increasing participation rates.</p> <p>?? An increased number of empty pesticide containers could potentially be collected as a result of targeting these areas.</p>
<i>Queensland Farmers' Federation</i>	<p>?? QFF has taken an active involvement in promoting the program, both to government and industry.</p> <p>?? A QFF member represents rural industry on the national <i>drumMUSTER</i> Advisory Committee. This member is also on the QFF Environment and Natural Resources Committee, and the NFF Farm Chemicals Sub-Committee and ensures that these committees are advised of any <i>drumMUSTER</i> issues and progress.</p> <p>?? The QFF Environment and Natural Resources Committee meets bimonthly, and <i>drumMUSTER</i> has featured on each agenda since the program started. Recent feedback is overwhelmingly positive, with the only negative feedback coming from farmers in areas where the council does not intend to sign up to the program. Farming bodies have been advised to lobby these councils.</p> <p>?? Information dissemination:</p> <p>?? A section of QFF's Weekly Bulletin is dedicated to <i>drumMUSTER</i>. This Bulletin is circulated to all QFF member organisations, several State Government Departments (e.g. DPI, DNR, EPA etc) and Ministers and farmers. The Bulletin is also posted on the QFF website each week.</p> <p>?? QFF member organisations also distribute information through weekly mailouts, or in their publications such as CANEGROWERS magazine, and Qld Fruit and Vegetable News.</p> <p>?? QFF website contains information on <i>drumMUSTER</i>.</p>
<i>NSW Agriculture</i>	<p>?? Department has no direct involvement in implementing, promoting or evaluating the effectiveness of the <i>drumMUSTER</i> program.</p> <p>?? Department strongly supports the principle of reducing long-term industry reliance on non-returnable farm chemical containers.</p>

Organisation	Comments
<i>Environment Protection Authority (NSW)</i>	<p>?? EPA is interested in the following specific outcomes of the <i>drumMUSTER</i> review:</p> <p>?? Progress in avoiding waste through alternative packaging;</p> <p>?? Status of end use markets and opportunities for developing them;</p> <p>?? Whether the number of rejected containers is still an issue; and if so, what actions have been taken to address this;</p> <p>?? Local government acceptance of <i>drumMUSTER</i> and identification of barriers to participation and</p> <p>?? Availability of the <i>drumMUSTER</i> program to urban users such as pest control operators.</p>
<i>Avcare Limited</i>	<p>?? All farmers must have access to the <i>drumMUSTER</i> program (ideally within two years of being charged the levy)</p> <p>?? More resources need to be allocated to state promoters to increase council participation</p> <p>?? Government should consider reworked plastic as part of their "green" tendering process</p> <p>?? <i>drumMUSTER</i> must review the levy amount so that sufficient flexibility is built in to cope with changing circumstances, whether these be up or down</p> <p>?? Control and liability of the program must rest with the same entity. separate entity comprising <i>drumMUSTER</i> stakeholders, with full powers and legal responsibility could be considered</p> <p>?? More parity is required between industry partners, in terms of making association members obliged to pay the levy.</p>
<i>The Veterinary Manufacturers and Distributors Association</i>	<p>?? Performance targets set at initiation of program did not take account of rapid changes in the Australian agriculture sector and results to date should not be judged harshly on this point</p> <p>?? To their knowledge all VMDA members marketing containers eligible for <i>drumMUSTER</i> are participating</p> <p>?? Support need for transparency of program participation</p> <p>?? Are concerned that there are still high risk practices being used by farmers in disposal of containers</p> <p>?? Support in general the findings of the review</p>

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APPENDICES

APPENDIX (I)

SURVEY RESPONSES OF COUNCILS THAT HAVE RUN COLLECTION PROGRAMS

APPENDIX (II)

SURVEY RESPONSES OF UNSIGNED COUNCILS

APPENDIX (III)

SURVEY RESPONSES OF RETAILERS

APPENDIX (IV)

SURVEY RESPONSES OF FARMERS

APPENDIX (IV)

SURVEY RESPONSES OF FARMERS

APPENDIX (V)

SURVEY QUESTIONNAIRE COUNCILS THAT HAVE RUN COLLECTION PROGRAMS

APPENDIX (VI)

SURVEY QUESTIONNAIRE UNSIGNED COUNCILS

APPENDIX (VII)

SURVEY QUESTIONNAIRE RETAILERS

APPENDIX (VIII)

SURVEY QUESTIONNAIRE FARMERS

APPENDIX (IX)

FREQUENCY TABLES ALL SURVEYS

APPENDIX (I) SURVEY RESPONSES OF COUNCILS THAT HAVE RUN COLLECTION PROGRAMS**Total = 51****Q1 Why Councils are dissatisfied or very dissatisfied with the *drumMUSTER* collection program**

#	Reasons	Survey ID
1	Advertising requirements are onerous	013
2	Administration is onerous	013
3	Farmer apathy	015, 026, 051
4	Lack of notice	027
5	Drums not collected from previous collection	027
6	Growers should perform this task	038
7	Collection rates low	043

Q2 Why Councils view *drumMUSTER* as being unsuccessful or very unsuccessful

#	Reasons	Survey ID
1	Education & promotion of program	004
2	Farmers unable to clean some containers sufficiently, depending on the chemical	007, 045
3	Farmer apathy/poor farmer participation	013, 014, 015, 023, 045
4	Containers left outside unmanned compounds	023
5	Low number of drums collected	026, 043
6	Difficult to get farmers to change disposal methods	036
7	Steel drums still need to be buried	038

Q3 Difficulties experienced by Councils with the *drumMUSTER* program

#	Difficulties	Survey ID
1	Early stages only	001
2	Information, education and advertising should have started earlier	003
3	Administrative workload	004
4	Staff resources	004
5	Some chemicals difficult to clean	007
6	Construction of new compounds at short notice	009
7	Workload in sorting containers for recycling or reprocessing	009
8	Farmers bringing drums when <i>drumMUSTER</i> not being held	010
9	Poor farmer participation	011, 013, 016, 023
10	Farmer organisation had not briefed farmers on requirements	012
11	No recyclers in Tasmania, and to date insufficient collections to justify recycler visiting Tasmania from mainland	014, 016
12	Poor farmer participation due to specific collection times	015
13	Drum stockpiles on properties require cleaning	015
14	Some farmers do not see benefits of spending time to rinse and deliver drums to <i>drumMUSTER</i>	037
15	Drum processor	038
16	Recovering full costs of service	038, 048
17	Operators unsure of where to place containers to allow efficient processing of containers	039
18	Collection rates low	043
19	Getting farmers enthused to use <i>drumMUSTER</i>	045
20	Knowing what drums to collect - many have lost their stickers	045

Q3 Difficulties experienced by Councils with the *drumMUSTER* program (cont.)

#	Difficulties	Survey ID
21	Drum processor will not take steel drums	019, 038
22	Removal of containers from the site	020, 027
23	Amnesty - where is the cut off point?	021
24	Lack of uniformity in labelling	021
25	Retailer invoices not distinguishing where levy has been paid	021
26	Retailers incorrectly charging levy	021
27	Lack of knowledge about Avcare standards/proper rinsing procedures	021, 047, 048
28	Difficult to change habits	023
29	Receival of non- <i>drumMUSTER</i> drums	025
30	Farmers not punctual for appointments	026
31	Notice times	026
32	Communicating effectively to farmers with a limited budget	035
33	<i>drumMUSTER</i> stickers are coming off the drums	049
34	Information about <i>drumMUSTER</i> is not being presented and understood at point of sale	049

Q4 Why Council is dissatisfied or very dissatisfied with the drum processor

#	Reasons	Survey ID
1	Unreliable	001
2	Disorganised	001
3	Slow (containers from first collection not removed yet)	007, 008, 011, 020, 026, 027
4	Drum processor not used yet	011
5	Drum processor not used yet due to insufficient collection of drums; not economical unless 000's of drums	013, 015, 024, 034
6	No processor in Tasmania	014
7	Management did not pass on information to onsite workers	030
8	Arrived at collection centre without warning (keys not available)	030

Q6 Problems or difficulties encountered by container inspectors

#	Problems/Difficulties	Survey ID
1	Water entering stockpiled containers due to high rainfall	001
2	Uncleaned containers/poor rinsing	002, 007, 013, 014, 016, 034, 051
3	More time required to process and inspect the drums	005
4	Residue on drums/difficult to clean (frustrating farmers)	007, 037
5	Farmers not keeping to appointments	007, 027, 034, 043
6	Container eligibility confusion	014
7	Difficult to assess if drum cleanliness is sufficient (i.e. difference between clean and unclean)/judgements on cleanliness	015, 045
8	Rebooking farmers who have had unclean drums	045
9	Hostile farmers if drums rejected	048
10	Farmers lack of knowledge of <i>drumMUSTER</i>	048
11	Difficult to see inside some drums for inspection purposes	049

Q12 Consultative mechanism established by Councils to inform retailers of plans for *drumMUSTER* collection programs

#	Consultative Mechanism	Survey ID
1	Public meetings	001
2	Letters	001, 006
3	Inspectors visit chemical sales outlets	005,024, 047, 050
4	Personal feedback	006
5	Posters	006, 047
6	Regional waste management group	013
7	Retailers display posters whenever <i>drumMUSTER</i> collection is planned	014, 028, 033, 035, 047
8	Retailers advised when collections are to occur	021, 028,030, 033, 037, 047, 048, 050, 051
9	Fax	029
10	Press release for inclusion in retailer newsletter	035, 041
11	Meet with retailers prior to, and after collections	041
12	SAFF	042
13	Direct phone contact	043
14	<i>drumMUSTER</i> working group committee	045

Further comments - participating councils

#	Comments	Survey ID
1	Levy should be increased to cover council's costs	002
2	<i>drumMUSTER</i> is an excellent program	003, 021
3	Improved advertising at P.O.S would make <i>drumMUSTER</i> more effective	003
4	Farmer dissatisfaction if high rejection rate of non-stickered drums	009
5	Farmer education required (economic & environmental reasons for <i>drumMUSTER</i>)	012
6	<i>drumMUSTER</i> paper work must be reduced (or more councils will stop participating)	013
7	Need greater control over ownership of containers i.e. purchaser of container must account for its disposal (to decrease illegal dumping or burning)	013
8	Time constraints of collections an issue (alternative of secured area where farmers could place empty drums at any time. Contractor would then wash and shred drums before processing).	015
9	Many dairy containers ineligible	017
10	<i>drumMUSTER</i> should include <u>all</u> farm containers to minimise confusion and reduce landfill waste Ineligible drums make up 50% of collected drums (041)	021, 030, 041
12	Farmers who understand cleanliness standards are very satisfied with <i>drumMUSTER</i>	037
13	Council won an environmental award for its <i>drumMUSTER</i> program	037
14	Many farmers have asked for information on chemical disposal	041
15	More manufacturers should be part of the program	041

APPENDIX (II) SURVEY RESPONSES OF UNSIGNED COUNCILS**Total = 44****Q1 Other reasons for non-participation in *drumMUSTER***

#	Reasons	Survey ID
1	Regional collection program being reviewed/negotiated	003, 018, 020, 027, 037, 043
2	Council's current contractor not recognised as an inspector by <i>drumMUSTER</i>	004
3	Council's liability	006
4	Waste management review to be undertaken by council (<i>drumMUSTER</i> will be investigated)	009
5	Chemical companies should bear the cost	010
6	Why is it council's problem?	015
7	Awaiting agreement between Agsafe and Netwaste	016
8	Regional waste management group has signed	017
10	Awaiting finish of the ChemCollect program	018, 040
11	Need more farmer education regarding container rinsing	019
12	Chemicals should be disposed first, then drums	023, 040
13	Not approached by <i>drumMUSTER</i> to participate in the program	028
14	Council currently surveying its farmers prior to making a decision	031
15	Staff changeover	032

Q1 Other reasons for non-participation in *drumMUSTER* (cont'd)

#	Reasons	Survey ID
16	Collection program operated by Coleambally Irrigation	034
17	<i>drumMUSTER</i> is not a high priority for council - council is "waiting"	035
18	Presently negotiating with <i>drumMUSTER</i>	038
19	Council believes <i>drumMUSTER</i> program is not cost neutral	039
20	<i>drumMUSTER</i> service agreement is cumbersome and takes time and effort to process	040

Q2 (a) Council's main reasons for not signing *drumMUSTER* service agreement

#	Reasons	Survey ID
1	Regional waste management group will be signing agreement on behalf of councils	003, 017, 043
2	Unknown	008
3	Industry responsibility	012
4	Insufficient reimbursement	012
5	Inadequate consultation	012
6	Finalisation of agreement between Agsafe and Netwaste	016
7	Farmers do not recognise importance of rinsing containers	019
8	Potential problems with shire staff and farmers at collection point	019
9	Will sign <i>drumMUSTER</i> now that constraints have been removed (staffing increased, completion of projects)	026
10	Drum collection centres have been established in the area	030
11	Collection program operated by Coleambally Irrigation	034
12	Unsure - current waste disposal system allows the rural sector to dispose of containers at 23 bulk bin sites around the shire, making it difficult to enforce compliance with the scheme	039

Q2(b) Things that would influence the councils decision to sign the agreement

#	Influences	Survey ID
1	Fully self-supporting program, full cost recovery \$15/hr is not a true indication of labour cost - overheads need to be factored in	001, 008, 012 021, 039
2	Recognition of current drum processor as inspector by <i>drumMUSTER</i>	004
3	Councils should not be involved at all	005
4	Regional agreement negotiated with <i>drumMUSTER</i> responsible for payments and contractor responsible for inspection of drums	006
5	Removal of liability	012
6	<i>drumMUSTER</i> inspectors taking full control of inspections	008
7	Regional response, including collection, transport and disposal	012, 015
8	Assurance that drums will be removed	018, 021
9	If the service was not being provided at major centres nearby	030
10	Farmer support for the program	031
11	Farmers willingness to rinse containers properly	035, 039

Further comments -unsigned councils

#	Comments	Survey ID
1	Many unanswered questions	001
2	What happens to rejected containers?	001
3	Staff liability issues	001
4	Contaminated sites	001
5	Is container collection guaranteed?	001
6	Dumping out of hours	001
7	Consultation with councils initially poor	001, 006
8	Heavy local government responsibility for little/no financial benefit	001
9	Council should not be involved	005
10	Chemical industry that creates the problem should be involved in the clean-up(i.e. should take responsibility)	005, 010
11	Risks/costs associated with <i>drumMUSTER</i> are prohibitive	005
12	Levy should not have been introduced until all councils signed-up	005
13	Lack of grass roots support has affected success of <i>drumMUSTER</i>	005
14	New project officer's flexible approach has influenced decision to sign-up	006
15	<i>drumMUSTER</i> should be implemented on regional or ROC basis to provide efficiencies for contractor and to assist with advertising	006
16	Council has been waiting for Netwaste to establish a contract for the participants	007
17	Councils feel pressured to participate because the <i>drumMUSTER</i> program has led farmers to believe that local councils will participate. (and if they do not the council is at odds with the community)	010
18	Poor provision of information to council has resulted in delays in commencing <i>drumMUSTER</i>	020
19	<i>drumMUSTER</i> agreement is not "user friendly" and this is slowing councils progress with getting involved with the program. The document is too large and cumbersome	040

APPENDIX (III) SURVEY RESPONSES OF RETAILERS**Total = 119****Q3 Main reasons for not including a statement on the invoice informing customers of the levy**

#	Reasons	Survey ID
1	Have product called <i>drumMUSTER</i> that is charged to each invoice accordingly	002
2	Unsure	003
3	Human error	007
4	Program not operational in this area	013
5	Incorporate into price	022, 039, 055
6	Computer setup (too expensive to alter computer system for levy statement)1	024, 081, 086, 112, 114
7	Most clients refuse to pay the levy	029
8	Lost sales/competitive pressures	031, 107
9	Most customers already aware of levy	032, 080
10	No reason (just have not done it)	037
11	No room on dockets	041
12	Farmer confusion due to different pricing by retailers	042
13	Retailer confusion about which drums allowable	060
14	Levy included until new GST compliant computers were introduced	076, 108
15	Manual invoices	077

Q3 Main reasons for not including a statement on the invoice informing customers of the levy (cont'd)

#	Reasons	Survey ID
16	Not practical	080
17	We don't have farmers returning empty drums - they only return them to the council	092
18	Levy not charged because councils in the area are not signed up with <i>drumMUSTER</i>	096
19	Absorb levy into cost	101

Q7 Other sources of posters/P.O.S. displays promoting *drumMUSTER*

#	Sources	Survey ID
1	CRT (Combined Rural Traders), Rural Co	001, 041, 057, 069
2	From Wesfarmers	009
3	Self made	013
4	Company newsletter	013
5	Department of Primary Industries	027
6	<i>drumMUSTER</i> update on internet site with IAMA	050
7	Through own organisatio	066
8	From Growforce	067
9	Don't know where they came from	090
10	No P.O.S. material offered	081,112
11	Headoffice	085
12	Agsafe	101

Further comments

#	Comments	Survey ID
1	Councils in region not participating in <i>drumMUSTER</i>	001, 004, 012, 013, 015, 017, 025, 033, 037, 040, 049, 058, 066, 067, 069, xxxx, 090, 105, 106, 103, 119
2	Confusion between <i>drumMUSTER</i> & drum recycling programs run by some council	001
3	<i>drumMUSTER</i> badly run and organised	002, 031, 057
4	Most farmers burn or bury drums	002, 025, 070
5	<i>drumMUSTER</i> has not changed buying habits in relation to pack sizes	002
6	Retailers are carrying the burden and empty drums	004
7	Products in non-returnable containers should be more clearly stated	005
8	Farmer confusion that non-returnable means that they cannot be returned to a <i>drumMUSTER</i> depot	005
9	More information should be provided to farmers	005
10	Farmer's purchase behavior is influenced by brand not packaging	006
11	<i>drumMUSTER</i> is a great idea that has been poorly implemented	012, 057
12	Farmers objected to paying levy when <i>drumMUSTER</i> is unavailable in their area (viewed as a roort/tax) (viewed as money raiser for Canberra & chemical companies 069), ("one of the greatest rip-offs I have seen 104)	002, 004, 012, 025, 034, 045, 066, 069, 090, 104, 119
13	Collection sites should have been verified before the start	012
14	Trying/ wanting to get <i>drumMUSTER</i> started; support for <i>drumMUSTER</i>	013, 037, 105
15	Farmers do not understand which drums are eligible for <i>drumMUSTER</i>	016

Further comments (cont'd)

#	Comments	Survey ID
16	<i>drumMUSTER</i> is working well	018
17	Clay based products are a problem	018
18	Farmers happy to pay levy if council provided a collection facility	025
19	Farmers buy envirodrums or granular herbicide to avoid paying the extra 4 cents/kg/l	025
20	Retailer had to influence council to get <i>drumMUSTER</i> started, <i>drumMUSTER</i> staff did not get involved	028, 068
21	Farmer/grower association had to lobby council to get <i>drumMUSTER</i> started	068
22	Council believes they will lose money operating <i>drumMUSTER</i>	028
23	<i>drumMUSTER</i> is keeping too much of the levy	028
24	Some retailers not charging the levy (absorbing it into their costs)	028, 074
25	<i>drumMUSTER</i> costs retailer time and money	031
26	Farmers interested but no <i>drumMUSTER</i> program in area	037, 066, 087
27	Problems with council providing informatio	038
28	Problems with council providing a facility for the implementation of <i>drumMUSTER</i>	038
29	Council information poor regarding collection times	041, 050, 081, 110
30	Farmers object to end-user being the only one to contribute to the scheme	045
31	Councils were slow to be informed about <i>drumMUSTER</i>	047, 056,
32	Councils were slow to adopt <i>drumMUSTER</i>	047, 057, 068, 074
33	Nearest collection point too far away - freight cost prohibitive	049

Further comments (cont.)

#	Comments	Survey ID
34	Council slow to reply to questions about <i>drumMUSTER</i>	050
35	Posters & flyers for mailing with statements requested	050
36	Retailer needs explanation of <i>drumMUSTER</i> (new to industry)	052
37	Farmers wish more could be done to reduce packaging problem	067
38	Collection frequency too low (difficult for farmers to organise to be at a collection one day in 6 months)	068, 070
39	Collection hours should be longer	070
40	Low participation rates in <i>drumMUSTER</i> (even after heavy publicity)	075
41	Farmers would prefer a "one stop" collection i.e. council accept all empty containers and then separate them into <i>drumMUSTER</i> eligible, ChemCollect	075
42	Farmers need more education on proper cleaning of drums and what is acceptable. If drums are rejected, farmers will be reluctant to use <i>drumMUSTER</i> again	085
43	Retailers are receiving many complaints from farmers that council is not running <i>drumMUSTER</i> in area	087
44	No one accepting responsibility for promotion of <i>drumMUSTER</i> - only gets a cursory comment at meetings, but mostly it is deemed non-essential	090
45	Cheaper to buy 20L drums than refillables or water solubles	094
46	Most councils in area (Devonport) do not charge for disposal of triple rinsed containers left at waste transfer sites	096
47	Misunderstanding about <i>drumMUSTER</i> comes more from councils than farmers - need education/promotion	098
48	<i>drumMUSTER</i> working better in certain areas depending on level of council support	102
49	Retailer strongly supports <i>drumMUSTER</i> , however council is not providing the service	106
50	High degree of inconsistency with inspection of drums	109
51	Councils unwilling to take responsibility for chemical waste due to misunderstandings about storage of drums and chemical wastes	109

APPENDIX (IV) SURVEY RESPONSES OF FARMERS**Total = 102****Q2 Other sources of information about *drumMUSTER***

#	Reasons	Survey ID
1	Charge on invoice	003
2	Farm weekly	006
3	Country man	006
4	Canegrowers	023, 035, 044, 048, 051, 073
5	NSW Farmers Association	028, 100, 101
6	NFF	028
7	WA Farmers Federation	033
8	Farmer organisation	038
9	SA Farmers Federation	011, 039, 057, 064, 088
10	Qld Farmers & Graziers (Agforce)	047
11	Farm magazine	054
12	VFF	058, 074, 082
13	Cotton growers association	081

Q7 Reasons farmers are dissatisfied or very dissatisfied with *drumMUSTER*

#	Reasons	Survey ID
1	No <i>drumMUSTER</i> depot in region	001, 068, 073
2	Charging a levy and then not receiving a service is a disgrace/no return on levy payment	001, 068
3	Local council has refused to participate due to perceived cost burden of <i>drumMUSTER</i>	014
4	Many chemicals not available in returnable containers or <i>drumMUSTER</i> containers and farmer has no choice when purchasing them.	019
5	High cost in transporting containers to <i>drumMUSTER</i> site - no refund for farmers	019
6	Many chemicals should be supplied to retailers in bulk, then drums would be recycled on farms. Manufacturers need to be encouraged to do this	026
7	Sarina Council runs the program very well	048
8	Travelling to <i>drumMUSTER</i> site involves long distances	076
9	Limited operational hours make it impractical for farmer to participate in <i>drumMUSTER</i>	077
10	No acknowledgement of farmer 4c/ltr contribution	085
11	Cleanliness standards vary at inspections	085
12	Council has only recently signed with <i>drumMUSTER</i>	090

Further comments

#	Comments	Survey ID
1	Farmer buys bulk chemical i.e. 1000L shuttles, 200L drums - <i>drumMUSTER</i> should apply to all drums	001
2	Charging a levy and then not receiving a service is a disgrace/ a "rip-off" "we have paid over \$3,000 - why??"	001, 037, 087 068, 090, 091, 093
3	<i>drumMUSTER</i> TER is "a joke" for broadacre intense farmers	001
4	Farmer avoids buying <i>drumMUSTER</i> containers due to levy charge with no depot	001
5	Farmer has little knowledge of <i>drumMUSTER</i>	004, 005
6	Does <i>drumMUSTER</i> operate in our area?	004
7	How does farmer dispose of drums and unused spray in non <i>drumMUSTER</i> area	004
8	Retailer views <i>drumMUSTER</i> as an administration problem	005
9	Farmer believes <i>drumMUSTER</i> will cost farmers as council's will incur a cost to provide the service	005
10	Unaware of <i>drumMUSTER</i> in area	010
11	<i>drumMUSTER</i> stickers do not stick	011
12	Chemical industry should be responsible, not councils	014
13	Use levy to fund research to help eliminate drums/containers	014
14	Use granular chemicals	014, 021
15	No collection site in area (7120, 6488)	018, 021, 037, 101
16	Farmer does not understand what the sticker means - who collects the containers, how will containers be delivered	020
17	When do farmers see audited accounts?	021
18	Why are farmers paid a rebate on recycling drums when they could be using envirodrums?	021
19	<i>drumMUSTER</i> is not working - we incinerate our drums	036

Further comments (cont.)

#	Comments	Survey ID
20	Farmer would like to use <i>drumMUSTER</i> however limited operational times are inconvenient, especially if only have a small number of containers. Collection site should have extended hours	041, 077
21	Retailers should accept empty containers - a refundable deposit would see more containers returned	041
22	Not sure if council service is <i>drumMUSTER</i>	051
23	Closest <i>drumMUSTER</i> site is too far away (limited times)	053
24	A portable site may be used by more farmers	053
25	<i>drumMUSTER</i> is working well - please ensure it continues	064, 089
26	Council had to be pressured to get <i>drumMUSTER</i> underway	064, 066
27	<i>drumMUSTER</i> is a much needed service	066, 090
28	Clean rinsing specifications difficult to meet, many triple-rinsed containers rejected (Bravo) due to chalky residues; marker fluid dye containers rejected due to discolouration	066, 078
29	Many farmers unaware of need to make appointment on collection day and were turned away	078
30	Responsibility for rinsing containers when farmer is not the end user needs to be clarified e.g. when aerial applicator is the last one to handle the chemical	081
31	Not all drums come with stickers on - I have asked for drums/containers only with stickers on	082
32	What about oil drums/containers	082
33	Farmers are striving to be environmentally friendly	090
34	<i>drumMUSTER</i> cleaning standards are too high - drums are too difficult to clean, cheaper to burn or bury them	091
35	No <i>drumMUSTER</i> , but local council has a large container at the rubbish tip for chemical containers	094
36	Council reviewing a regional program	101