

National Agricultural Plastics Stewardship Scheme: What's next?

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- An Implementation Plan for a proposed National Non-Packaging Agricultural Plastics Stewardship Scheme has been submitted to the Australian Government
- One of the critical next steps is the establishment of an Industry Working Group to progress the Implementation Plan
- The scheme is aiming to commence nationally from the 2024/25 financial year onward, pending progress of the Industry Working Group and outcomes from further consultation with key stakeholders

Background

This project developed a proposed agricultural plastics stewardship scheme for non-packaging plastic waste. The scheme aims to facilitate and incentivise a viable market to recycle agricultural plastics. It involves solutions for on-farm retrieval, from farm collection logistics, processing technology and equipment and development of recycled plastic products and their markets.

This project was one of 24 funded under the National Product Stewardship Investment Fund (NPSIF) and a key initiative of the National Waste Policy Action Plan. It was implemented from January 2021 to March 2023.

The scheme has been developed and modelled to exclude existing (e.g. drumMUSTER, Big Bag Recovery) and emerging (e.g. bagMUSTER, Dairy Australia silage wrap) plastic stewardship schemes to ensure complementarity and that producers are not 'double-charged' if multiple recycling schemes or levies exist.

The scheme focuses on the following priority plastic types (Figure 1):

- **Protective film** – grain silo bags, protected cropping film, cotton wrap and table grape covers
- **Piping, irrigation and drainage** – tube and tape
- **Nets and mesh** – hail and bird netting

Key achievements

The RMCG and Growcom project team have achieved the following outcomes over the past two years:

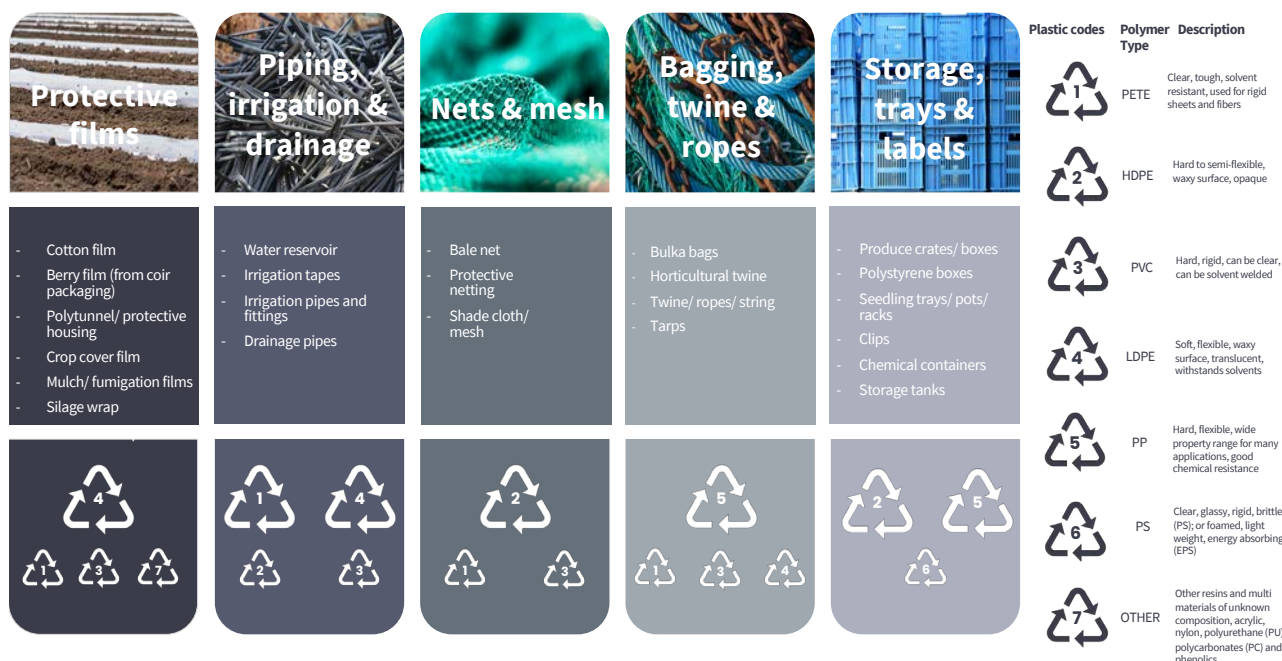
1. Feasible industry-led national scheme for non-packaging agricultural plastics ready to be implemented with established governance, administration, logistics and accreditation procedures and sustainable financial model
2. Increased sustainability of farm practices facilitated through avoidance of waste, resource recovery and recycling through pilot schemes
3. Improved industry partnerships and coordination so plastic collectors and processors can service the agricultural sector with viable end markets (new or existing) for products

Progress against outcome 1

The proposed National Non-Packaging Agricultural Plastics Stewardship Scheme will be a voluntary industry-led scheme with government accreditation with the following objectives:

- Increase the amount (tonnes) and proportion (%) of end-of-life agricultural plastics **collected** from Australian farms

Figure 1. Five most common uses for plastic in agriculture and their corresponding polymer type codes



- Increase the amount and proportion of agricultural plastics **recovered** through mechanical (primary) and advanced (secondary) recycling
- Reduce the amount and proportion of end-of-life agricultural plastics that are **inappropriately disposed of** on-farm through stockpiling, burying and burning
- **Explore opportunities** to further avoid, reduce or reuse agricultural plastics to decrease the total amount needing to be recovered for recycling

The scheme demonstrates the plastic sector is taking a proactive approach to meeting Environmental, Social and Governance (ESG) commitments, as well as ensuring a sustainable agriculture industry that continues to meet market access requirements and consumer expectations to manage waste responsibly and reduce environmental impact.

The ultimate aim of circularity is for waste agricultural plastics to be **turned back into their original products**, such as irrigation tube being recycled back into irrigation tube and old table grape covers being used to create new table grape covers (Figure 2).

The recycling pathway of different plastic products and polymer types differs based on the value, quality and technical feasibility of recycling the waste plastic.

This has influenced the design of the stewardship scheme through a modular, or staged, approach.

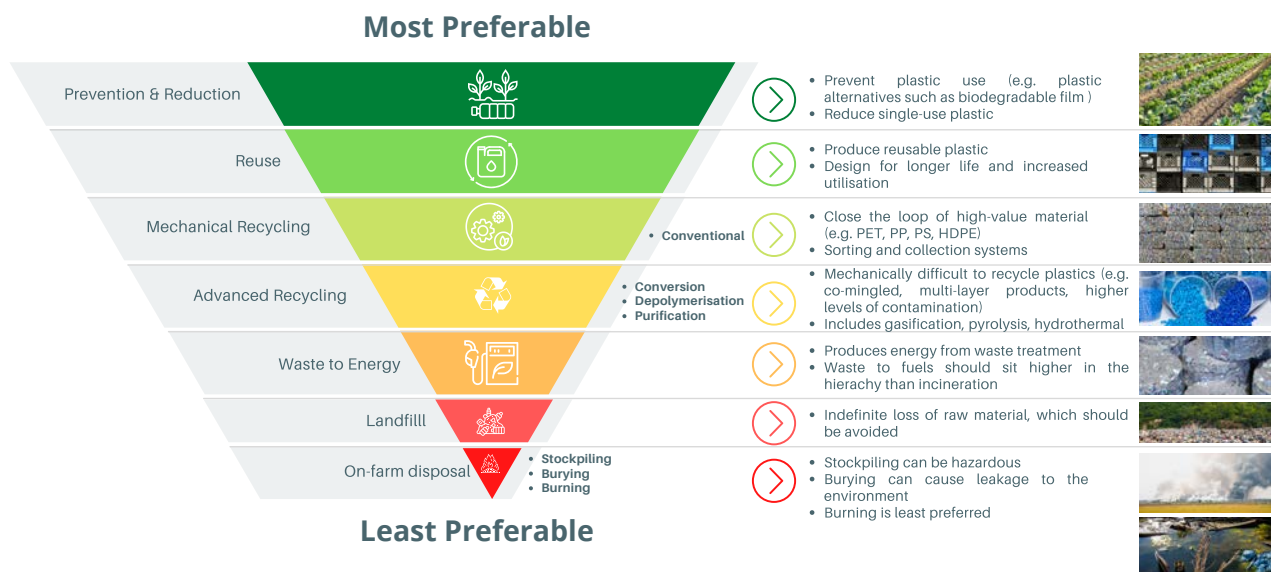
Based on the plastic data analysis and material flow, current mechanical recycling capacity and relative value and quality, it is estimated that approximately **68,000 tonnes of agricultural plastic waste** could be collected per year by a stewardship scheme at full operational scale. This represents about 80% of the total annual volume of waste not covered by existing or emerging schemes.

Of these 68,000 tonnes, it is proposed that 41,000 tonnes (60%) could be mechanically recycled (most preferable) with 13,500 tonnes (20%) recycled using advanced technologies (less preferable).

Due to limitations with market capture rate of schemes and difficulties with collection, transport and contamination, it is estimated that 17,500 tonnes (20% total volume) would remain on-farm and either stockpiled, buried or burnt. In addition, some collected plastics will not meet re-processor specification and will need to be landfilled.

Leakage from the scheme through non-compliant plastic is estimated to be 13,500 tonnes per year or 20% of plastic collected.

Figure 2. Agricultural plastic end-of-life management and the waste hierarchy



Progress against outcome 2

The Victorian pilot directly collected and recycled **81 tonnes of irrigation tube and grain bags** over six-months from May to October 2022 that would have otherwise ended up in landfill or contaminated the environment through incorrect disposal on-farm, such as stockpiling, burying or burning.

The Queensland pilot found that **growers are willing to participate in a recycling program** and undertake separation of drip tape and mulch on-farm; however, there are a number of challenges such as time, cost and suitability of current retrieval equipment. High volumes of organic material and soil contaminate the used plastic and reduce its potential to be recycled.

In addition, approximately **150 tonnes of grape covers** were indirectly collected by an existing regional service that was improved through partnerships developed under the Victorian pilot.

Progress against outcome 3

Significant progress has been made against the third outcome in improving industry partnerships and coordination. This is evidenced by the project team having:

- Engaged with **515 stakeholders** around the country in the agriculture, plastic and waste sectors, including product manufacturers, plastic recyclers and existing stewardship scheme operators
- Distributed an initial project summary in February 2021 and communicated industry updates in July 2021;

January, July and December 2022; and May 2023 to keep stakeholders **informed of project progress**

- Sought **expert input** from a Project Reference Group through six meetings over the course of the project (April, August and December 2021; July and November 2022; and May 2023)
- Collaborated closely with the **dairy and nursery industries** who were working on complementary stewardship projects funded under the NPSIF
- Continued a productive working relationship with the **Product Stewardship Centre of Excellence**
- Engaged with agricultural plastic **manufacturers, suppliers, re-processors, collectors and local government** to understand their challenges with collection, transport, contamination and processing of particular products
- Engaged with **existing stewardship owners** to explore issues related to governance and funding models
- Worked with the **National Farmers Federation** to consider solutions at a national scale
- Collaborated with **agriculture, fisheries and forestry** Research and Development Corporations to understand specific plastic waste issues and contribute to possible solutions
- Collaborated with **AgriFutures Australia** to contribute an understanding of plastic waste to their program on 'Pre-farm Gate Waste for Agriculture, Fisheries and Forestry'

Scheme design

Governance

Following extensive consultation and research of existing schemes, it is proposed that the Product Stewardship Organisation (PSO) for agricultural plastics be a not-for-profit company limited by guarantee as described in Figure 3. This would ensure the following principles are met:

- Voluntary
- Purpose-driven and independent
- Not-for-profit
- Flexible

The company would consist of a Board representing members and other experienced Non-Executive Directors with ultimate responsibility for establishing the constitution with a clear description of why the organisation exists. Other responsibilities of the Board include appointment of the CEO, setting strategy, undertaking risk analysis and determining and administering the levy. The composition and number of seats on the Board will be an important early consideration for the PSO.

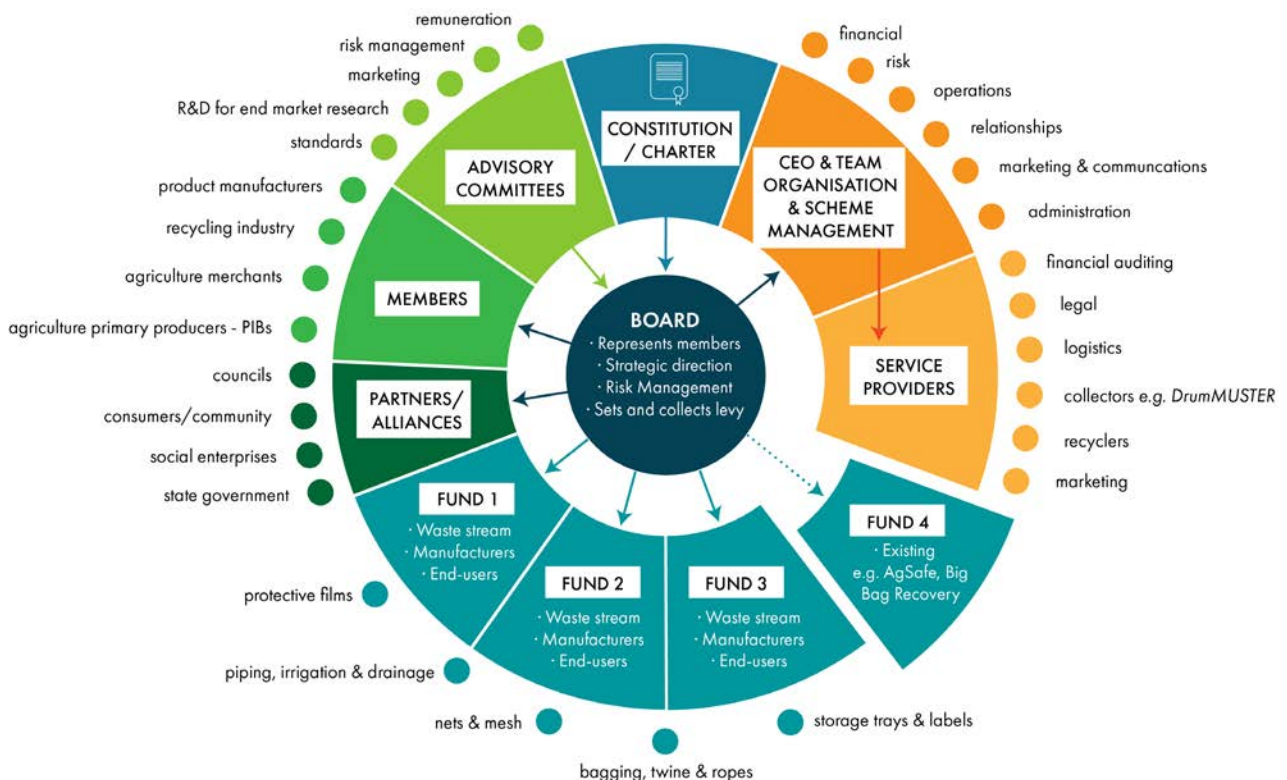
Separate funds would be established for individual plastic waste streams with responsibility for recommending the levy rate and contributing to Board deliberations on expenditure. The PSO would provide shared administration common to all funds. Additional funds could join the scheme as they emerge, providing flexibility over time. These funds would allow for the segregation of finance systems and activities to ensure that members' money is overseen by an independent entity.

The CEO and executive team would be responsible for implementing the strategy and all administrative functions related to scheme management (including compliance and auditing) and the engagement of service providers.

Advisory committees with specific skills and interests would be established to ensure contribution of additional expertise on issues such as research and development (R&D), marketing and standards providing advice to the Board.

The Board would also work to communicate strategy and performance with members and partners. Of particular relevance will be advocacy to government on issues of importance, such as free riders and non-participating farmers.

Figure 3. Scheme entity structure and key components



Administration

The administration of the PSO will involve support for the Board, team organisation and scheme management. The Board meetings will be structured around the organisational constitution (purpose), strategy and organisational objectives.

Policies and procedures will be developed to inform the five-year strategy with the establishment of annual operating plans. Key performance indicators will be monitored annually, publicly available and independently assured.

The functions shared across all scheme funds will include:

1. Compliance and auditing
2. Infrastructure and logistics
3. Research and development
4. Communication and education

Funding

A detailed economic analysis was conducted to determine the operating costs of the stewardship scheme. This figure was then used to develop a cost per kilogram of plastic sold in the Australian market. It is expected that this cost will be passed on at an individual 'point of sale' level, however this would be confirmed through the ACCC Authorisation process.

The scheme is estimated to collect 51,000 tonnes of agricultural plastic waste per year in the first five years of operation, which increases to 68,000 tonnes per year thereafter. The plastic recovered is expected to increase from 41,000 tonnes per year (33%) to 54,500 tonnes per year (64%) at full operation. A summary of the scheme collection and recovery rates is provided in Table 1.

The scheme will raise revenue through a levy applied to plastic put on the Australian market, as high up the supply chain as possible (i.e. the manufacturer). This will establish a sustainable scheme from the onset and build industry and end-user confidence while allowing long-term planning. A levy was deemed to be more cost-effective for industry when compared to other models, such as a user-pays system.

A levy (per kilogram) was calculated by combining all of the costs associated with the scheme and dividing by the total amount of plastic generated annually, excluding industries and plastic types mentioned above. A levy has been proposed that would cover all operating costs. However, it will be up to the new scheme entity to determine the levy structure and amount.

Nutrient	Value (Years 1-5)	Value (Years 6-15)
Plastic collected (t/yr)	51,260	67,914
Percentage collected	41%	80%
Plastic recovered (t/yr)	41,008	54,331
Percentage of plastic recovered	33%	64%
Plastic to landfill (t/yr)	10,252	13,583

Scheme operation

Collection sites

The scheme ensures the majority of plastic waste can be aggregated through strategically located collection sites that are relatively easily accessed by farmers to drop off material free of charge. The drop-off collection points for the scheme include those situated in priority locations with capacity to temporarily store and aggregate agricultural plastic waste prior to it being pre-processed and transported to a recycler.

The scheme plans to operate approximately 450 collection sites at full operation after 10 years.

Pre-processing

There are a number of options for pre-processing agricultural plastic waste as part of the scheme, depending on the type of plastic and regional context (e.g. number and location of collection sites). The main methods that will be employed include baling, chipping and granulating, however baling is preferred as it is suitable for most plastic types and mobile balers can be strategically moved to multiple collection sites.

Transport and logistics

Transport and logistics constitute a large proportion of scheme operating costs due to large distances between the source of plastic waste in regional and rural areas and location of recyclers often in capital cities.

This further highlights the importance of pre-processing to reduce size and minimise contamination of the agricultural plastic waste prior to transport from collection site to recycler.



Plastic mulch retrieval and source separation is a key issue for Queensland growers. Photo credit: Brock McDonald



The project team worked with agricultural plastics processors to better understand their requirements and current challenges. Photo credit: Carl Larsen

Re-processing

The ultimate aim of circularity is for waste agricultural plastics to be turned back into their original products, such as irrigation tube being recycled back into irrigation tube and old table grape covers being used to create new table grape covers.

The recycling pathway of different plastic products and polymer types will differ based on a number of factors and influenced how the scheme was designed.

This is largely dependent on the plastic value, quality and technical feasibility to be mechanically recycled.

The scheme will preference mechanical recycling due to its technology readiness and commercial scale in Australia.

Communication and education

It is important that the scheme provides adequate farmer and industry training and education through targeted communications and capacity building initiatives.

Communication material will include fact sheets, retrieval instructions and frequently asked questions (FAQs) about the scheme, supported by online and traditional media channels to raise awareness of the scheme and promote participation.

Research and development

Research and development (R&D) will be critical to the scheme maintaining current markets and developing new markets for agricultural plastic waste. This will ensure there is sufficient demand for cost-effective recycle based on supply, comparative to virgin resin prices.

Next steps

The following recommendations have been provided to the Department of Climate Change, Energy, the Environment and Water:

1. Use the objectives, scope, design and operation components of the Implementation Plan as the basis for the National Non-Packaging Agricultural Plastics Stewardship Scheme to complement other existing and emerging schemes.
2. Establish an Industry Working Group comprised of the main suppliers, retailers, users and recyclers of agricultural plastics to progress the Implementation Plan and maintain momentum to develop circular economy solutions for agricultural plastic waste.

The leadership role of the founding scheme members should continue to be recognised and leveraged.

3. Implement a phased approach to scheme launch over the next 12 months by the Industry Working Group.
4. Secure additional funding from founding members and other sources for the scheme launch over the next 12 months, which includes provision of independent executive and secretariat support to the Industry Working Group.
5. Continue engagement with the plastic and agriculture industry, existing product stewardship scheme operators and local government, building on the significant consultation undertaken in the development of the Implementation Plan.
6. Aim to commence the National Non-Packaging Agricultural Plastics Stewardship Scheme from the 2024/25 financial year onward, pending progress of the Industry Working Group and outcomes from further consultation with key stakeholders.
7. Monitor progress of the scheme against the five-year targets following launch. Should these targets not be met, consideration should be given to promoting the inclusion of agricultural plastics on the Minister's priority list which names products and materials that need urgent product stewardship action.
8. Explore options for government regulation to support minimum recycle targets for the manufacture of new agricultural plastic products to incentivise and assist in meeting individual business targets.

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