CLOSED LOOP–THE FUTURE FOR AGRICULTURE FILMS RECYCLING

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Introduction

In early 2022, Berry Global began a collaboration with Cleanfarms and PolyAg Recycling in Canada to close the loop in the recovery of used agricultural films and grain bag material by creating new products with recycled content.

The origins of this pioneering project date back to 2010 and mark the first exploration into effective ways to collect used grain bags for recycling. The current program, known as the Saskatchewan Grain Bag Recycling Program, began in 2017 in the province of Saskatchewan and has since expanded to the provinces of Manitoba, British Columbia, and Alberta.

This White Paper explains the background to the project, its success and expansion, and looks at the wider implications for the global agricultural sector as the world continues to transition to a circular and net zero economy.

Films' Key Role in Agricultural Production

For many plastics products, sustainability is intrinsically linked to the '3Rs –reduce, reuse, recycle– but there are other ways in which the material can contribute to a more sustainable world.

Plastics play an important role in helping to reduce food waste by extending shelf life for longer periods of time than many alternative substrates. In addition to preserving the food on our shelves, plastic is equally critical in foods initial growing stages.

For instance, during winter months, agricultural films make it possible for modern beef and dairy production systems to continue with business as usual by providing proper protection of forage, a vital food source for livestock.

In addition to forage, agricultural bags can also provide fast, efficient, and reliable storage solutions for commodities such as grain, citrus peels, brewers mash, fertilizers, and compost.

Well-maintained grain bags can store grain for as long as one year and forage as much as two.

A key development in agricultural films was the introduction of co-extruded multi-layer silage bale wrap which was first introduced by Berry over 30 years ago. Since then, we have seen the introduction of 5-, 7- and now 9-layer stretch films, offering high levels of protection and reliability.

The Canadian Project

Dealing with plastic waste is an issue that has dominated governments' environmental policies throughout the world for many years. In Canada, the government has launched its Zero Plastics Waste agenda to keep plastics in the economy and out of the environment.

Nevertheless, in Canada farmers have already been quite progressive and forward-thinking when it comes to dealing with their plastic waste. Containers have been recycled for over 30 years and grain bag recycling tests started well before the federal zero waste initiatives, with the Saskatchewan initiative coming into effect at around the same time as the first public discussions on federal zero waste.

The challenge for agricultural bags and films is that while they play a vital role in crop storage, protection and enhancement, by the very nature of this role, they are large and bulky and therefore pose something of a challenge when it comes to their end of life.

The priority for the disposal of these products is that they do not end up in landfill sites. And in Canada, the message to the industry has been clear–if you make it, it is your responsibility to take care of it when its work is done. This is manifested in Saskatchewan's The Agricultural Packaging Product Waste Stewardship Regulation, introduced in July 2016. The regulation requires the establishment of an industry-led stewardship program for agricultural grain bags, with a solution to collect and recycle the grain bags sold into the province by manufacturers.

As far back as 2010, in the city of Moose Jaw, the Moose Jaw River Watershed Stewards hosted the first grain bag collection day. The project developed over the years, investigating ways to effectively collect and transport the used material. By 2017, there were 14 collection sites around the province and over 2,500 tons of material had been recycled.

In response to the The Agricultural Packaging Product Waste Stewardship Regulation, Cleanfarms, a non-profit environmental stewardship organization, developed a Product Stewardship Program on behalf of grain bag first sellers in the province. Following government approval, the Saskatchewan Grain Bag Recycling Program launched in 2018.

The program now enables farmers to collect used grain bags once they are finished with them and take them to collection sites for recycling. At the collection sites, empty bags are mechanically rolled and secured with twine before being taken to a recycling facility. Details of the program can be found here and here.

The grain bags are then picked up by Cleanfarms and transported to specialist agricultural plastic recycler, PolyAg Recycling where they are shredded into flakes, washed, and heated and extruded into pellets. These pellets are then purchased by Berry for incorporation into the manufacture of new ag film products.

There are currently 47 collection sites throughout Saskatchewan and 8,500 tons of grain bags have been shipped since the program's inception. In 2020, 60% of bags sold in the province were returned for recycling, which is a high return for such a young initiative. Additional grain bag recycling programs have now been established in Manitoba with pilots operating in Alberta and in one community in British Columbia.

Why are we Doing this?

It is true to say that up until recently, there has not been a great demand for recycled content in agriculture films. However, this is starting to change and certainly the impact of climate change, the challenge of waste materials, and increasing consumer interest in protecting the environment, mean that the time to act is now. The Canadian federal and provincial governments' commitment to zero plastics waste is likely to be repeated throughout the world.

That is why Berry has recently set sustainable packaging goals to achieve 100% reusable, recyclable, or compostable fast-moving consumer packaging by 2025, and 30% circular plastic use across its fast-moving consumer goods packaging by 2030.

But equally, we realize that action needs to be taken in other markets as well. As the world continues to move away from fossil fuels and implement a circular economy, the plastics industry has to take the lead, in particular in demonstrating plastics' continuing vital role.

We need to be setting the agenda and moving forward before legislation and regulation are imposed on us. In this way, we can ensure that the solutions we initiate are workable and the products we develop practical and fit for purpose. We therefore need to start to drive demand for recycled material for agricultural applications.

Implications for Agricultural Film Manufacturers

Achieving the above aims is not as simple as it may sound. The critical role that agricultural films play in crop protection and enhancement is largely a result of the highly technical manufacturing processes which have been developed and refined for the substrate over the years.

The incorporation of recycled pellets into the manufacturing process therefore must be handled carefully to ensure finished products maintain the equivalent performance of multilayer constructions.

More specifically, bags made with recycled pellets must be able provide the high levels of tear and puncture resistance needed to protect crops in harsh farm working environments.

The Saskatchewan Grain Bag Recycling Program couples Berry's materials knowledge and expertise with our vast experience garnered through our unique processing and extrusion capabilities to deliver products which are comparable to those manufactured entirely from virgin material.

Designing such products is a gradual process. While several of our initial production runs incorporated just five percent recycled material, our ongoing goal is to continue to optimize our manufacturing techniques so that we can steadily increase the percentage of recycled material incorporated into our products. Our immediate goal is to reach 50 percent and our ultimate objective is to have the ability to make products entirely from recycled material. This will depend heavily on our work with local recycling companies to secure access to recycled material at scale.

Moving Forward

The success and expansion of the Saskatchewan Grain Bag Recycling Program emphasizes the vast impact that schemes can have on the progression of circularity.

The program's successful implementation in Canada indicates the feasibility of collection programs for agricultural films recycling and suggests their ability to be implemented with relative ease in smaller territories. It also underlines the value in industry taking initiative and the importance of having the support of national and local government, as well as other interested parties, such as NGOs.

As a film manufacturer, Berry recognizes the immense potential for plastics to help drive a circular economy. We will continue enabling collected materials to be recycled into new products to help drive demand for more products made with recycled content.

However, the success of this project will depend on full collaboration with all interested parties.

Conclusion

In a world where plastics' role is continually being questioned and challenged, it is essential to continue demonstrating the material's vital contribution to achieving a circular and net zero economy. Closed loop recycling is a crucial part of this, and the agricultural films sector has the opportunity to take the lead.