



environmental
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agency

Ocean

Cultivating Plastic

Part 3 - Agriplastic waste
mismanagement and
criminality

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ABOUT EIA

We investigate and campaign against environmental crime and abuse.

Our undercover investigations expose transnational wildlife crime, with a focus on elephants and tigers, and forest crimes such as illegal logging and deforestation for cash crops like palm oil. We work to safeguard global marine ecosystems by addressing the threats posed by plastic pollution, bycatch and commercial exploitation of whales, dolphins and porpoises. Finally, we reduce the impact of climate change by strengthening and enforcing regional and international agreements that tackle climate super-pollutants, including ozone depleting substances, hydrofluorocarbons and fossil fuels.

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Front cover: The open burning of agriplastics is common place around the world, and it is thought burning of agriplastic waste still takes place in the UK.

Above: Agricultural crates dumped in the open environment. Mismanagement often occurs because agriplastic waste is contaminated, especially with mulch due to soil contamination. However, mismanagement of other agriplastic products when they become waste happens too.

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Introduction

Mismanagement and criminality of agriplastic waste further compounds their environmental and human health impacts due to increased leakage into the open environment, extending from farmland to marine ecosystems.

A major driver of the environmental impacts of agriplastics is the lack of waste collection facilities and their fundamental lack of closed-loop recyclability.

In the absence of clear routes for disposal and recycling, agriplastics are more vulnerable to mismanagement, with demonstrable examples of them being dumped, burnt or illegally exported (likely then dumped,

landfilled or incinerated in recipient countries) across the UK supply chain.

Mismanagement and criminality of agriplastic waste further compounds their environmental and human health impacts due to increased leakage into the open environment, extending from farmland to marine ecosystems.

Lack of recyclability and high level of disposability

The reasons for this increased risk of mismanagement and criminality include the scale of use, agriplastic product design, high level of disposability and contamination throughout use.

The three main agriplastic polymers are polyethylene (PE) (specifically low-density polyethylene, LDPE), polypropylene (PP) and polyvinyl chloride (PVC).¹ All have varying degrees of recyclability depending on recycling infrastructure availability and polymer product composites.

It is crucial to highlight that PVC, in particular, is considered a highly problematic and toxic plastic, given it contains dangerous chemical additives,² is virtually unrecyclable and is often used in applications with high risk of pollution.³ The lifespan of these agriplastic products largely depends on product type and use, but in general⁴ the majority of products are single use and disposed of in less than 12 months.⁵ Mulch, in particular, is a highly problematic agriplastic waste stream, used on average for two to four months and comprising 40 per cent of the global agriplastic market.⁶

At end of life, plastic mulch is highly contaminated with soil residue, rendering it a lot more difficult to recycle. Coupled with an absence of established collection and recycling infrastructure for agriplastics globally, in addition to their environmental impacts throughout use, this high rate of disposal and contamination of waste increases the risks of leakage into the environment and makes it a lot more vulnerable to illicit waste management – or, rather, lack of management.

Of the estimated 12.5 million tonnes of agricultural plastics used globally each year, only a small fraction are collected and recycled.⁷ The Organisation for Economic Co-operation and Development (OECD) estimates that less than 10 per cent of plastic waste as a whole was recycled in 2019 globally.⁸

Given the contamination issues of agriplastic waste, proportionally their recycling rate is likely much lower than this.⁹ Global estimates about the quantity of agricultural plastics that are recycled are not available, with only a few countries providing data.¹⁰ The UN Food and Agriculture Organisation (FAO) reports that some agricultural plastics are collected and recycled, predominately in developed economies¹¹ yet, despite this, plastic pollution leakage from agricultural activities to the environment represents a major issue, especially in the context of the world's demand for plastic increasing, including in the agricultural sector.¹²

In the UK, there are no mandatory reporting measures in place for agriplastics and Government data is currently outdated¹³ and does not provide the level of detail required to extrapolate potential estimates. Furthermore, different industry sources have different estimates when it comes to terrestrial agriplastic use.¹⁴ For instance, Agriculture, Plastic & Environment UK (APE UK) estimates that the total volume of new plastic products sold to UK farms is between 36,000-40,000 tonnes annually, with about half being silage bale wrap,

and this estimate does not include spray/oil canisters, fertiliser/seed bags, etc. When accounting for soil contamination, this amounts to approximately 65-70,000 tonnes of agriplastic waste available for collection annually.

The Chartered Institution of Wastes Management (CIWM) has estimated about 135,500 tonnes of terrestrial agricultural plastic waste are produced each year, the majority being non-packaging plastics (including contamination, such as soil),¹⁵ but this only provides an insight into macro-agriplastics and is a far from complete picture. The UK's Department for Environment Food and Rural Affairs (Defra) also refers to CIWM's estimate of 135,500 tonnes of agricultural waste plastic produced annually in the UK, citing that only 20-30 per cent are reprocessed into new products.¹⁶

It is vital to note that farmers have often cited costs for collection being incredibly high and that collection for recycling and reprocessing agriplastic waste varies widely across the UK. For instance, a 2020 market analysis of farm film plastics by Zero Waste Scotland

found that more than half of Scottish farms have a collection service in all areas, with the exception of Argyll and Bute, Tayside on the mainland, Shetland and Eilean Siar – highlighting how collection is challenging in remote regions such as the Scottish islands and west coast.¹⁷

Furthermore, in 2019 Welsh farmers were temporarily left with no means of recycling agriplastic waste after the only company dedicated to its collection suspended its services, stating it was no longer economically viable.¹⁸

As a consequence, due to the lack of supporting regulatory policies other than the obligation that agriplastic waste must be collected for recycling and reprocessing, voluntary initiatives have been created in a bid to facilitate the collection and recycling of agriplastic waste in the UK and voluntary certification schemes exist that have certain agriplastic waste requirements for suppliers across the UK grocery retailer supply chain. Despite this, mismanagement and criminality of agriplastic waste across the UK grocery retailer supply chain is present.

Voluntary agriplastic waste initiatives in the UK

EIA reached out to two voluntary UK initiatives with regards to agriplastic waste management to learn more about their objectives.

This includes APE UK, which was launched in March 2020.¹⁹ This initiative seeks to provide farmers with a sustainable solution to the environmentally responsible management of non-packaging agricultural plastics and to increase the quantity and quality of plastics collected.

Backed by a group of agriplastic manufacturers and distributors, it aims to increase the rate of recycling of agriplastic waste to 75 per cent in five years. Initially, APE UK sought to incentivise recycling by paying gate fees (£20-£45/T) charged by recyclers to pre-treat some agricultural plastic waste. This payment was funded through the environmental protection contribution of 2p/kg (£20/T) paid by farmers when buying their new plastics.²⁰ APE UK now focuses on achieving its aim by working with farming unions, the Government and its agencies to build agreement on needed Government interventions, to develop funding requirements and a national collection scheme.

There is also the voluntary Green Tractor Scheme for agriplastic waste collection.²¹ Green Tractor has also been in existence since 2020, but the collector members have been in existence since 2006 since the introduction of EU regulations regarding the correct disposal of farm plastic waste. Currently, Green Tractor has seven corporate ambassadors,

11 collection and processing members, more than 80 collection sites nationally and 14,000 customers. It has the ambition to make all agricultural plastic waste recyclable by 2030.

The scheme accepts the collection of all agriplastic waste, including silage wrap and sheet, string, fertiliser bags, spray cans, pots and seed trays, shogun cartridges, net wrap compost bags and mulch. Green Tractor is currently undertaking an audit of how much agriplastic waste it collected in 2022, which will be published shortly; the most recent publicly available data cites that it collected 24,149 tonnes of agriplastic waste in 2019.²² However, in correspondence with the EIA, Green Tractor stated that the weights of collected items do not relate completely to amount of plastic due to contamination – for example, when recycled, approximately 50 per cent of the weight of collected silage wrap is contaminated with organic waste.

Green Tractor Scheme members are required to follow due diligence requirements with regard to how waste is managed. Given that some members are waste collectors only, some waste collected is then sold to other reprocessors and recyclers which are not Green Tractor members. Given the nature of the plastic waste trade and current regulations, Green Tractor Scheme members are not always privy to what is being sold to whom and the waste's final destination. Some of the agriplastic waste collected is assumed to be exported.



Dumping

Dumping of agriplastic waste has been well documented in Spain, one of the largest suppliers of fresh fruit and vegetables to UK supermarkets.

In 2021, Spain was the largest sourcing region of fruit and vegetables for the UK, providing vast amounts of produce throughout all seasons. Publicly available information indicates that this has included supplying UK supermarkets such as Tesco,²³ Sainsburys,²⁴ Asda, Lidl, Aldi,²⁵ Co-op,²⁶ Waitrose²⁷ and Morrisons.²⁸

One of the most intensive agricultural regions in Spain is Almería, where growers rely heavily on migrant workers and the significant use of agriplastics, including greenhouse covers and mulching. The high levels of agriplastic use, like irrigation piping, is also to account for the significant levels of water scarcity in the region, with droughts worsening as a result of climate change.²⁹

It has been estimated that approximately 1503.6kg of plastic waste is generated per hectare annually, which is not only expensive to treat (averaging 0.25 €/kg), but also exceeds the capacity of current waste management systems in place. Therefore, mismanagement and the

dumping of agriplastic waste is incredibly commonplace, resulting in environmental and human health impacts of agricultural workers.³⁰ It is important to note, however, that the incredibly concerning working conditions of migrant agricultural workers in the region extend far beyond the health impacts from working with highly contaminated agriplastic waste.

The resulting negative environmental impacts of this dumping are all the more acute given Almería's coastal location, with agriplastic waste often left in riverbanks or by beaches and then making its way into the surrounding marine environment and threatening both the marine ecosystem and wildlife.

Above: Agriplastic waste dumped on the Spanish coastline. Given Almería's coastal location, a significant amount of agriplastic dumping takes place directly by the Mediterranean or in surrounding riverbeds, meaning the level of agriplastic waste pollution in the surrounding marine environment is incredibly high.



Habitat impacts: Agriplastic contamination of Spanish seagrass meadows

Seagrasses are productive but declining shallow-water ecosystems that support communities of fish and invertebrates and provide necessary carbon sequestration and coastal protection.³¹

Dahl et al. (2021) measured microplastic contamination in soil cores collected in Posidonia oceanic seagrass meadows, collected from Almería and Cabrera Island, in Spain. Almería's intensive agricultural industry, with 30,000 hectares of plastic-covered greenhouses, has been shown to negatively affect the health of the local seabeds, which are highly degraded.

The study found a clear correlation between the development and production of the greenhouse

agricultural industry in the Almería region in the mid-1970s and the concentration of microplastics in the nearby historical seagrass soil record.³² An increased microplastic load, where seagrass meadows may serve as long-term sinks for plastic particles, can alter seagrass soil properties, significantly influence the growth and health of the seagrass plants³³ and can have negative impacts on the fauna within these ecosystems.³⁴

Plastic has also been found on the leaves of seagrass beds.³⁵ Seagrass meadows are already under pressure from human activities³⁶ and agricultural and other plastic pollution can additionally impact the habitat and reduce the vital ecosystem services that they provide.³⁷

Species impacts: agriplastic ingestion and death in cetaceans off the coast of Spain

There have been a number of cases of agricultural plastics correlating to the deaths of deep-diving cetaceans.

On the southern Spanish coast of Granada in 2012, a dead male sperm whale, an endangered species in the Mediterranean, was found to have 17kg of plastic greenhouse waste in his digestive tract, including plastic greenhouse covering, black plastic mulching, pieces of burlap plastic bags and ropes and hosepipes.³⁸

In February 2018, a severely underweight sperm whale was found with 29kg of plastic in its stomach on a Spanish beach in the Murcia region³⁹ – an area where data indicates that the majority of marine plastic pollution relates to agricultural activity.⁴⁰

This is not unique to Spain; a number of other incidents have been reported in recent years. A young sperm whale and an emaciated Risso's dolphin had sheet plastic in their stomachs, potentially from agricultural sources, in Greece.⁴¹ The Coordinadora para o Estudo dos Mamíferos Mariños (CEMMA) reported three Cuvier's beaked whales, in three different incidents, with possible agricultural plastics in their stomachs.⁴²

Above: Mulch pollution in the Mediterranean. Micro and macro agriplastic pollution has been shown to have negative effects on marine flora providing vital ecosystem services as well as result in cetacean deaths.

Burning

The open burning of agriplastic waste releases contaminants into the atmosphere; these include persistent organic pollutants such as polychlorinated dibenzodioxins and dibenzofurans (PCDD/Fs), the release of which has been shown to be particularly high in the burning of PVC-based agricultural plastic waste.

As a consequence of their lack of recyclability and either lack of, or unaffordable, waste collection and recycling infrastructure, historically and to date many farmers and growers also dispose of agriplastic waste by burning it on farms. The burning of plastics poses serious threats to human health and the environment, releasing contaminants into the atmosphere; these include persistent organic pollutants such as polychlorinated dibenzodioxins and dibenzofurans (PCDD/Fs), the release of which has been shown to be particularly high in the burning of PVC-based agricultural plastic waste.⁴³

The burning, burying and stockpiling of agriplastic waste was once commonplace on UK farms.⁴⁴ As a consequence, in 2019 Scottish – and previously in 2006 for English and Welsh – farmers have been legally required to dispose of agricultural plastic waste through licensed recycling and reprocessing routes. They can no longer burn or bury agricultural plastic or packaging on their land. However, the Environment Agency and Defra have documented instances of burning of agriplastic waste since these bans came in place.⁴⁵

Which raises the question as to why – despite the harm and illegality of burning agriplastic waste, which then impacts soil quality, the surrounding environment and human health – UK farmers and growers still do this on farmland on which they depend for their livelihoods?

This is because these bans alone did not result in adequate enforcement capacity for the Environment Agency – which is heavily underfunded⁴⁶ – or an adequate change in the disposal costs or recycling capacity⁴⁷ or demand for this, typically highly contaminated and thus poor-quality plastic waste feedstock.

Despite there being UK recyclers and voluntary producer responsibility initiatives⁴⁸ in place to spur a market for agriplastic waste recycling, the placement of waste treatment costs on farmers and not agriplastic producers (i.e. a mandated Extended Producer Responsibility scheme for agriplastic waste) means that UK farmers are at times faced with an impossible self-destructive choice, given the expense and viability of agriplastic waste collection and recycling. The ultimate driver, of course, is agriplastics use and their inherent lack of recyclability.

Agriplastic Waste Transfer Note regulatory loophole exploited in the UK

Under the legal duty of care and devolved nation Waste Management Regulations, agricultural waste, including agriplastics, must be collected using registered waste carrier services or regional recycling services which can legally remove plastic waste from farms – with completion of collection being confirmed via the attainment of a Waste Transfer Note.⁴⁹ Not following these regulations, including the burying and burning of agriplastic waste, can result in fines of up to £50,000 in additional to legal and environmental clean-up costs.⁵⁰

However, Defra has identified a significant regulatory loophole that can be exploited as a result of the current lack of mandatory reporting of agriplastic usage in the UK. Its findings from the Interreg Preventing Plastic Pollution project in 2021⁵¹ showcase how farmers and growers can often

simply pay to recycle the minimum amount of agriplastics required to attain a Waste Transfer Note to be certified by their assurance scheme and, given the lack of reporting on the actual amount of agriplastic waste they use and lack of inspection, can thus simply burn any remaining agriplastic waste on farm sites without it necessarily being noticed.

“Most farmers take in just one ton to get their ticket as proof they’ve disposed of their plastic and burn the rest, like 20 tonnes, on-site, as it would cost them more to take it all.”

– Livestock farmer interviewed as part of the UK Interreg Preventing Plastic Pollution project



Agriplastic waste trafficking

Illegally exporting plastic waste, including agriplastic waste, has significant exploitative and unethical repercussions on environments and human health elsewhere in the world.

Another noticeable development following the banning of burning or burying of agriplastic waste on farmland in Scotland included the Environment Agency stating shortly after that it had noticed an increase in the levels of illegal exports of agricultural plastic waste.⁵² Illegally exporting agriplastic waste is not a new practice, but a form of waste trafficking that has been occurring for a number of years,⁵³ with UK practices thus having significant exploitative and unethical repercussions on environments and human health elsewhere in the world, given that this waste can then be mismanaged and dumped in recipient countries.⁵⁴

Current commercial confidentiality practices, publicly available data and plastic waste commodity code classifications limit the extent to which we can identify perpetrators of illegal agriplastic waste export activities. However, available evidence does show that plastic waste, including agriplastics, are known to be exported from the UK in a number of illegal ways. Common

methods are outlined below, as ascertained via publicly available information, speaking to industry sources and analysing information provided by the Environment Agency following a Freedom of Information request.

Methods include:

- misdeclaration or mislabelling of waste, including through concealment⁵⁵
- sending waste to non-compliant reprocessing sites abroad⁵⁶
- failure to follow sampling and inspection plans⁵⁷
- failure to maintain and provide records.⁵⁸

Above: Whether exported legally or illegally, plastic waste exports cause environmental and human health harm. High-income countries should not export their plastic waste.



Conclusion

As outlined within this report – the dumping, burning and illegal export of agriplastic waste is taking place.

Current regulatory and voluntary initiatives aimed at ensuring agriplastic waste collection, reprocessing and recycling are not inhibiting agriplastic waste mismanagement and criminality across the UK grocery retailer supply chain. In some cases, the inadequacy of certain regulations – such as a lack of mandatory reporting of agriplastic use and allowing continued plastic waste exports – are worsening the issue.

It is of the upmost urgency that these regulatory loopholes are closed, that those placing agriplastics on the market either directly (such as agriplastic manufacturers) or indirectly (such as grocery retailers) also pay for the true cost of agriplastic use and environmentally sound end-of-life treatment costs.

Crucially, given the struggle to achieve true and non-toxic circularity for this waste stream, resources must be provided to identify viable and safe alternatives that can be adopted by the agricultural sector.

Misdeclaration of UK agriplastic waste as plastic packaging

EIA identified at least one instance of fraud relating to agriplastic waste exports through the co-option of the UK's EPR scheme of packaging and use of Packaging Waste Export Recycling Notes ("PERNs"). An accredited waste broker/exporter can sell PERNs to businesses for them to attain mandated recycling targets through the UK's EPR Packaging Scheme. Exporters do this by exporting packaging waste for recycling abroad – which, even if done legally, results in environmental and human health harm and should thus be stopped.

Illegality comes into play when criminals misdeclare non-packaging waste exports as packaging. They are subsequently paid the equivalent PERN value, while the waste in question could likely be dumped or mismanaged upon arrival in the recipient country, given it has been misdeclared and is likely unsuitable for recycling. The costs and complexity involved in pursuing repatriation or compensation once in a destination

country can be prohibitive, meaning the recipients are often left to deal with the problem.

Through a Freedom of Information request, EIA identified an instance of agriplastic waste being misdeclared as packaging by the UK-based waste trade company Orange Recycling Ltd. Orange Recycling Ltd had its accreditation as a packaging exporter cancelled by the Environment Agency in December 2020 for failure to maintain and provide records on request and issuing PERNs for misdeclaring silage wrap as packaging waste. The company continued to be a registered waste broker/dealer, however, having had its licence renewed in February 2021.⁵⁹ It was dissolved in March 2022.⁶⁰

Above: Lack of enforcement and monitoring of exports enable waste criminality, current regulations are regularly exploited. Exporting waste is not a viable or environmentally-sound route for agriplastic waste recycling.



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56. Some UK-based exporters are known to try and send plastic waste to reprocessing sites abroad which do not meet UK-regulatory standards in terms of how they process and recycle the waste. In some cases, they may try and hide the actual final processing company from export documentation. In other cases, they may provide insufficient documentation to prove that the site is compliant or plan waste to be transhipped through different countries, making it more difficult for authorities to track its final destination.
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