

# Ag Plastics - Case Study 5

The Queensland horticulture industry is a significant user of a variety of plastic products within its production systems, in particular single use irrigation drip tape and plastic mulch for weed management and product quality, which face ongoing disposal issues.

The Queensland pilot was established to address the issue of the plastic mulch and drip tape supply chain across Southern, Central and Northern Queensland. Specifically, the pilot sought to investigate and address the following problems:

- awareness and knowledge of agricultural plastic recovery and recycling options
- on-farm retrieval, source separation and contaminant minimisation of irrigation tape and plastic mulch in horticultural production systems

- strong support for local and regional recycling of agricultural plastics but limited processor capacity
- lack of coordination in collecting and recycling plastic mulch and drip tape across the supply chain

To assist the horticulture industry address a range of disposal issues, the Queensland pilot sought to engage growers to ensure a greater proportion of waste material could be recycled in the future.

Through delivery of the pilot process the project sought to gain an understanding of the types of on-farm retrieval methodologies and plastic quality specifications. On farm assessments enabled the pilot to review and document the cost and time implications of current compared to revised retrieval methods to stress test barriers to adoption of recovering plastic mulch and drip tape on-farm.



## Case Study: 1.67ha block of strawberries in Stanthorpe during June 2022.

- The plastic mulch used on farm was 40um black (unknown brand) and each 80kg roll held 2300m x 1.2 m
- Single laterals of Rivulus 508/23/80 drip tape were used per bed and laid underneath the plastic mulch

Retrieval of the plastic mulch and drip tape from the Strawberry beds was conducted using an unknown manufacturer branded hydraulic conical roller modified (fit for purpose) and fitted to a Kubota M8540 tractor.

For the retrieval to commence the existing crop needs to have broken down (mulched off) sufficiently to reduce the amount of vegetation being collected. This can occur naturally or by applying a chemical spray (i.e. Reglone in this instance) to reduce the biomass.

The roller utilises rippers to loosen each side of the row to release the plastic mulch the loosening also aids the soil removal from the mulch plastic.

The planted row length is 100m with four rows retrieved to make a 120-130kg rolled bale of plastic mulch and drip tape combined.

ACTION	COST PER HA
Tractor p/hr cost	\$400
Labour cost p/hr x 2	\$544
Transport p/ton	\$396
Landfill cost p/ton	\$954
<b>Total</b>	<b>\$2294</b>

Each roll represents on average four bed rows of retrieved plastic mulch with an average of 8 rolls to the ton going to landfill.

The main reason the drip tape is not separated is that extra time taken to leave the tape and then return, and retrieve is not cost effective as there is estimated an extra four hours of labour and machine time.

There would be the possibility of adding a separate

roller to this to separate the drip tape.

Some engineering would be needed to equipment with the ratio of mulch exceeding the volumes retrieved in four passes than the drip tape.

Generalised findings from on-farm evaluations of retrieval methodologies and adaptations

- Retrieval equipment used by growers on-farm varies due to:
  - Difficulty and cost in adapting some existing equipment
  - Engineering new single pass equipment would improve on-farm retrieval
- Challenges to retrieval separation include:
  - Limited change of practice would be supported by further awareness raising and training
  - Opportunity to improve acceptable levels of contamination
  - Collection point assessment of contamination (pre-processing, shredding to reduce contamination)
  - Transport mass reduction to improve cost efficiency (bailing, compacting, pre-processing)
- Outcomes / Opportunities for future irrigation tape and plastic mulch recycling:
  - Growers are currently ill-equipped to separate drip tape from plastic mulch
  - High volumes of organic material and soil contaminate the used plastic and reduce its potential to be recycled
  - Currently there is no collection points for recycling of plastic mulch, with all going to landfill
  - Current landfill costs are acceptable with growers willing and able to pay at \$250-300/tonne
  - Overall low volumes of retrieved plastic in Queensland are not attractive to recyclers.