The data described below is from a report titled "***The fate of (compostable) plastic products in a full scale industrial organic waste treatment facility***" from Wageningen Food & Biobased Research (February 2020). The overarching goal of this report was to assess the degree to which various plastic products disintegrate upon treatment at waste facilities.

Table 1 displays the various plastic products that were analyzed, including both their composition and appearance. Your group will be focused on Plant Pot (D), Coffee Capsule (G), Coffee Pad (H), and Teabag (J), all of which contained the polylactic acid (PLA) polymer.

Table 2 highlights physical observations of how each plastic products looks after disintegration through an 11-day organic waste treatment cycle.

Table 3 presents information on the recovery and disintegration of each plastic product after undergoing an 11-day organic waste treatment cycle. Be sure to pay special attention to the amounts listed in the "Mass of product", "Recovery", and "Disintegration" columns.

Table 4 summarizes information on each plastic product's ability to disintegrate as well as the risk for physical or visual (color) contamination. Pay special attention to the last three columns of this table.

Table 1. Overview of materials introduced in the organic waste treatment trial

Code	Product	Composition	Pictures	
A	**GFT collection bag** *Compostability certificates:* *OK compost IND: TA8011300630* *OK compost HOME: O16-1859-A* *Compostable (Seedling): 7P2018*	Thermoplastic starch with biodegradable polyester		
B	**GFT collection bag** *Compostability certificates:* *OK compost IND: TA8011601461* *OK compost HOME: TA8021601496*	Thermoplastic starch with biodegradable polyester		
C	**Plant pot** *Compostability certificates:* *Compostable (Seedling):*	Thermoplastic starch with biodegradable polyester		
D	**Plant pot (cuttings)** *Compostability certificates:* *OK compost IND: TA8011500968*	PLA		

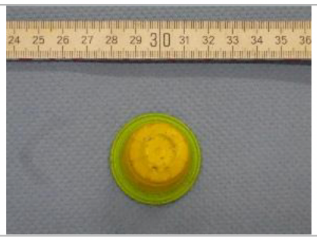
E	**Teabag (used)** *Compostability certificates:* *Compostable (Seedling):*	Paper and PLA fibres		
F	**Fruitlabel** *Compostability certificates:* *OK compost IND: TA8011903519* *Compostable (Seedling): 7H2020*	Biodegradable polyester coated paper		
G	**Coffee capsule (used)** *Compostability certificates:* *OK compost IND: O17-2386-B*	PLA with biodegradable polyesters		
H	**Coffee pad (used)** *Compostability certificates:* *Compostable (Seedling): 7P2096*	Paper and PLA fibres		
J	**Teabag (used)** *Compostability certificates:* *Compostable (Seedling): 7P2174*	PLA filter and thread, PLA coated tag		

Table 2. Observations regarding the disintegration of test products in mesh bags after the first organic waste treatment cycle of 11 days. Codes refer to materials in Table 1.

Code	Recovery of mesh bag	Observations
GFT collect bag (A)	Recovered	Bags clearly visible (cling together), reduced mechanical strength
(duplicate)	Recovered (small hole)	Bags clearly visible, reduced mechanical strength
GFT collect bag (B)	Recovered	Bags clearly visible (cling together), reduced mechanical strength
(duplicate)	Recovered (small hole)	Bags clearly visible, reduced mechanical strength (lower than A)
Plant pot (C)	Mesh bag partially damaged	3 pots observed, but brittle
(duplicate)	Mesh bag partially damaged	Lost part of content, no pots recovered, only pieces
Plant pot (D)	Recovered	No pots visible, only reference orange peel
(duplicate)	Mesh bag partially damaged	No pots visible, only reference orange peel
Teabag (E)	Recovered, but rather empty	Few teabags visible, difficult to distinguish from paper (brown)
(duplicate)	Recovered	No teabags found, difficult to distinguish from paper (brown)
Fruit label (F)	**NOT recovered**	
(duplicate)	Recovered	Labels visible, both on fruit as well as on the roll (no loose ones)
Coffee capsule (G)	Recovered	Capsules visible, some broken, softened and brittle, break with little pressure
(duplicate)	Recovered	Capsules visible, mostly fragmented, ring, foil, cup, break with little pressure
Coffee pad (H)	Mesh bag partially damaged	Lost part of content, packed together
(duplicate)	Recovered	Few pads visible, difficult to distinguish from paper
Teabag (J)	Mesh bag damaged a little	Most content recovered, teabags hardly visible (resemble leaves), the seam is easily torn, but fabric strength reasonably maintained
(duplicate)	Recovered	Found just 1 teabag, rest of the waste was well composted (due to better mixture and moisture content?)

Table 3. Recovery and calculated degree of disintegration of test products in mesh bags after the second organic waste treatment cycle of 11 days. Codes refer to the materials in Table 1.

Product (code)	Mass of product **@ start (excl. content)** (grams)	Recovery* (weight-% of start)	Disintegration* **[100% – recovery]** (weight-% of start)	Recovery in fraction 0-10 mm (grams)	Recovery in fraction >10 mm (grams)
GFT collect bag (A)	53	94	6	5	45
(duplicate)	53	8#	92#	n.d.	4
GFT collect bag (B)	37	100	0	2	35
(duplicate)	37	94#	6#	n.d.	35
Plant pot (C)	310	25#	75#	n.d.	79
(duplicate)	310	38#	62#	15	103
Plant pot (D)	22	1	99	0.3	0
(duplicate)	22	0	100	0	0
Teabag (E)	11	0	100	0	0
(duplicate)	11	0	100	0	0
Fruit label (F)	2.2	0	100	0	0
(duplicate)	2.2	X	*(mesh bag not recovered after 1st waste treatment cycle)*		
Coffee capsule (G)	131	91	9	70	49
(duplicate)	131	59	41	68	9
Coffee pad (H)	30	58#	42#	n.d.	17
(duplicate)	30	86	14	11	14
Tea bag (J)	14	0	100	0	0
(duplicate)	14	0	100	0	0

* Samples were not thoroughly cleaned before weighing, thus percentages are indicative only.

\# possibly some loss of product due to damaged mesh bags

n.d. not determined

Table 4. Qualification of the disintegration rate of tested compostable products, their risk of ending up in discarded residue fractions or contaminating the final compost. (NB. expert opinion of the authors based on all observations in the organic waste treatment trial performed at the facilities of Valor, Sint Oedenrode).

Product (code)	Co-benefit factor (kg extra GFT / kg product)	Disintegration rate	Risk of ending up in discarded residue fractions	Risk of visual contamination of compost
GFT collect. bag (A)		+	Low	Low
GFT collect. bag (B)		+	Low	Low
Plant pot (C)	+++	++	Low	Low
Plant pot (D)	+++	+++	Low	Low
Tea bag (E)	+++	++	Low	Low
Fruit label (F)		++	Low	Low
Coffee capsule (G)	++	+	Low	Possibly
Coffee pad (H)	+++	++	Low	Low
Tea bag (J)	+++	+++	Low	Low