Quantification of plastics in agriculture and fisheries at a regional scale: a case study of South West England

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Supplementary material

Table S1. Total agricultural land per crop grown in the SW in 2018 in hectares (South West includes Cornwall, Devon and Somerset. Source: CEH Land Cover® Plus: Crops 2018).

Crop	***Cornwall***	***Devon***	***Somerset***	***Total***	***Percentage***
Field beans	-	310.55	1,314.35	1,624.90	0.2%
Potato	4,709.84	952.75	849.60	6,512.19	0.9%
Oilseed rape	764.77	3,132.47	4,226.54	8,123.78	1.1%
Spring barley	7,468.32	7,055.34	1,129.44	15,653.09	2.0%
Spring wheat	6,673.01	6,432.67	4,151.98	17,257.67	2.3%
Other crops	8,646.99	5,774.46	6,184.05	20,605.50	2.7%
Winter barley	7,182.93	11,332.66	10,623.16	29,138.76	3.8%
Maize	6,571.91	13,817.44	13,642.95	34,032.30	4.4%
Winter wheat and oats	6,850.21	16,530.00	16,717.78	40,097.99	5.2%
Grass	139,025.87	296,261.80	156,995.60	592,283.27	77.4%
Total	**187,893.85**	**361,600.14**	**215,835.44**	**765,329.44**	

Data S1. Questions send to Fleet managers and Harbour Masters of the South West of the UK.

Fleet managers survey

Q1. Are you a current fishing fleet manager based in the South West region?

Yes__

No, please state role_____

Q2. How often do your fishing nets usually need to be replaced?

Please indicate the approximate time for each item:

Gill net:_____

Trawl net_____

Pots:_____

Rope/line:_____

Other, please indicate:_____

Don't know:_____

Q3. How much is the approximate cost to your fleet of replacement gear?

Please indicate the cost for the gear that you usually use.

Gill net:_____

Trawl net_____

Pots:_____

Rope/line:_____

Other, please indicate:_____

Don't know:_____

Q4. Have any of your nets or gear been entangled, lost at sea, or damaged beyond

Yes____

No____

Don’t know____

Q5. How many nets, pots, or lines have been entangled, lost at sea, or damaged beyond repair in the last year?

Q6. What is the approximate financial cost of lost gear in the las year?

Q7. Do you work with any ocean waste recovery projects, for instance Fishing for Litter?

Yes, please state__

No_

Q.8 Please indicate any support mechanisms that could be introduced to reduce the amount of lost fishing gear in the South West?

Q9. What are the major challenges for the South West fishing industry in 2020?

Harbour masters survey

Q1. Are you currently a Harbour Master/Port Manager?

Yes__

No, pleas state role____

Q2. Does your Port provide reception facilities for fishing vessel waste?

Yes_____

No_____

Sometimes_____

Don’t know_____

Q3. Where does the fishing vessel waste go? (please answer all that apply):

Waste to energy incineration_____

Recycling plant _____

Landfill_____

Collected by specialist waste recycling project, for instance Ocean Recovery Project

Other, please state____

Don’t know_____

Q4. Do you charge for waste disposal?

No_

Yes, please state approximate cost per tonne___

Don’t know____

Q5. What are the main challenges affecting the provision of waste/recycling facilities?_____

Q6. Which of the following materials can your Port recycle (please tick all that apply)

Gill net:_____

Trawl net_____

Pots:_____

Rope/line:_____

Other, please indicate:_____

Don’t know:_____

Q7. Which projects do you work with, for instance, Ocean Recovery Project, Fishing For Litter, Fathoms Free, etc.?

Ocean Recovery Project___

Fishing for litter

Fathoms free

Other, please state

Q8. Please indicate any support mechanisms that could be introduced to reduce the amount of lost fishing gear in the South West?

Q9. Please tell us any other information that you feel is relevant.

Table S2. Assumptions used to calculate the total packaging waste generation for agricultural activities in the South West, UK.

Potato							
Crop requirements (agrochemicals and seed rate)	**Description**	**Amount applied**	**Single pack size**	**Packaging Plastic type**	**Single packaging weight (gr)**	**No. of single packaging items required per ha**	**weight of sacks kg/ha**
Seed_rate	For Saturna variety	1890 kg /ha	Bulk Bag Agricultural seeds, dimensions= 100X100X150, capacity 1250kg, canvas thickness = 160gr/m2.	Polypropylene	1342.20	1.512	2.029
Main fertiliser	14-14-21 (N+ Phosphorus+ Potassium), YaraMila-Maincrop	1500 kg/ha	600 kg sacks	Polypropylene	570.78	2.5	1.426953125
Fertiliser_2	calcium nitrate, Yara	500 kg/ha	600 kg sacks	Polypropylene	570.78	0.833333333	0.475651042
Fertiliser_3	magnesium, Yara	20 L/ha	10L container	high density polyethylene (HDPE)	450	2	0.9

Fungicide	Fezan	Low-risk situation 0.5L/ha every 14 days per 120 days. Total days of application considered=8.6 times Total amount applied=4.3 L/ha	5L container	HDPE	500	0.86	0.43
Herbicide	Mohawk CS	0.25 L/ha	10L container	HDPE	1000	0.025	0.025
Insecticide	Sparviero	300ml every 7 days per 120 days Total considered= 4.8L/ha	1L container	HDPE	500	4.8	2.4
Growth regulator	certiseurope	11.1 L/ha once per year	5L container	HDPE	500	2.22	1.11
Spring wheat							
Seed_rate	applied to varieties: KWS Kilburn, KWS Alderon	240 kg/ha	500 kg Bulk Bag Agricultural seeds	Polypropylene	130	0.48	0.0624
Main fertiliser	20-10-10 (N+ Phosphorus+ Potassium)	375 kg/ha	600 kg capacity sacks	HDPE	130	0.625	0.08125
Nitrogen	Yara Vera recomendation	250kg/ha	600 kg capacity sacks	HDPE	130	2.4	0.312
Fungicide	Fezan	1 L/ha	5L container	HDPE	500	0.2	0.1
Herbicide	Mohawk CS	3.6 L/ha	10L container	HDPE	1000	0.36	0.36
Insecticide	Sparviero	0.05 L/ha	1L container	HDPE	500	0.05	0.025
Growth regulator	certiseurope	1.5 L/ha	5L container	HDPE	500	0.3	0.15

Winter wheat							
Seed_rate	applied to varieties: KWS Kilburn, KWS Alderon	200 kg/ha	500 kg Bulk Bag Agricultural seeds	Polypropylene	130	0.4	0.052
Main fertiliser	20-10-10 (N+ Phosphorus+ Potassium) kg/ha	375 kg/ha	600 kg capacity sacks	HDPE	130	0.625	0.08125
Nitrogen	Yara Vera recomendation	750 kg/ha	600 kg capacity sacks	HDPE	130	0.8	0.104
Fungicide	Fezan	1 L/ha	5L container	HDPE	500	0.2	0.1
Herbicide	Mohawk CS	3.6 L/ha	10L container	HDPE	1000	0.36	0.36
Insecticide	Sparviero	0.05 L/ha	1L container	HDPE	500	0.05	0.025
Growth regulator	certiseurope	1.5 L/ha	5L container	HDPE	500	0.3	0.15
Spring barley							
Seed_rate	Average seed rates. No specific variety was considered, as most spring malting barley grown in England (Barley growth guide, AHDB)	174 kg/ha	500 kg Bulk Bag Agricultural seeds	Polypropylene	130	0.348	0.04524
Main fertiliser	20-10-10 (N+ Phosphorus+ Potassium) kg/ha	500 kg/ha	600 kg capacity sacks	HDPE	130	0.833333333	0.108333333
Fungicide	Fezan	1 L/ha	5L container	HDPE	500	0.2	0.1
Herbicide	Mohawk CS	3.6 L/ha	10L container	HDPE	1000	0.36	0.36

Insecticide	Sparviero	0.05 L/ha	1L container	HDPE	500	0.05	0.025
Growth regulator	certiseurope	1.5 L/ha	5L container	HDPE	500	0.3	0.15
Winter barley							
Seed_rate	Average seed rates. No specific variety was considered, as most spring malting barley grown in England (Barley growth guide, AHDB)	190 kg/ha	500 kg Bulk Bag Agricultural seeds	Polypropylene	130	0.379241517	0.049680639
Main fertiliser	20-10-10 (N+ Phosphorus+ Potassium) kg/ha	250 kg/ha	600 kg capacity sacks	HDPE	130	0.416666667	0.054166667
Fungicide	Fezan	1 L/ha	5L container	HDPE	500	0.2	0.1
Herbicide	Mohawk CS	3.6 L/ha	10L container	HDPE	1000	0.36	0.36
Insecticide	Sparviero	0.05 L/ha	1L container	HDPE	500	0.05	0.025
Growth regulator	certiseurope	1.5 L/ha	5L container	HDPE	500	0.3	0.15