Research into using biodegradable pots

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Alternative Materials to Plastic

- Waste sludge from the paper industry
- shredded southern pine bark or rice hulls
- sugarcane leaves
- paperboard
- calcium carbonate, bio-degradable polymer and non-hydroxylic solvent
- cow dung

What Makes a Pot ‘Biodegradable’?

- EN 13432 (Tüv Rheinland Din Certco, 2019)
- To comply with these standards a product must possess the ability to undergo a complete biological decomposition due solely to the action of naturally occurring micro-organisms within 12 months
- Yet little has been published independently from the manufacturers of the pots as to the long-term suitability for growing plants in them.

Pot Composition

Pot Name	Material	Size	Cost (p)	Expected Life span
ACHICOO Biodegradable Pulp Nursery Cup	Paper pulp	8cm	20	6 months
Nutley's 8 cm Fibre Plant Pots	Peat and paper pulp	8cm	37	Unknown
Nutley's Coco Fibre Plant Pots	Coco fibre	8cm	35	18 months
Non-woven Plant Seedling Bags	Polypropylene	10cm	3	20-30 years
Zeagro Round Biodegradable Fibre Seedling Pots	Peat and paper pulp	8cm	11	Unknown
HairyPots (Kirton Farm Nurseries Ltd, 2019)	Coco fibre	9cm	10	18 months
Desch pot 5º D-Grade Bio (Desch Plantpak, 2019)	Plant based biopolymer	9cm	7.8	Min 5 years undamaged
Vipot (Fargro ltd, 2019)	Husk-fibre	9cm	14.5	Min 5 years undamaged
BioFibra (Soparco, 2019)	Wood fibre, rPLA, plant based binding agent	9cm	12.7	Min 5 years undamaged
Standard plastic pot - control	Polypropylene	9cm	3	20-30 years

Weights of the pots

		Freezer		Greenhouse		Capillary Matting		Outside		Standing in water		Fridge	
		1		2		3		4		5		6	
		Empty weight	Filled weight	Empty weight	Filled weight	Empty weight	Filled weight	Empty weight	Filled weight	Empty weight	Filled weight	Empty weight	Filled weight
1	ACHICOO	7	79	7	77	7	97	7	84	7	82	7	95
2	Fibre Plant Pots	8	96	8	86	8	92	8	91	8	84	8	90
3	Coco Fibre Plant Pots	10	65	10	67	10	75	10	62	10	65	10	62
4	Non-woven	1.2	211	1.2	238	1.2	216	1.2	227	1.2	233	1.2	236
5	Zeagro	6	74	6	81	6	73	6	82	6	78	6	83
6	HairyPots	31	162	31	143	31	142	31	134	31	151	31	156
7	Desch pot 5º D-Grade Bio	6	91	6	90	6	78	6	84	6	79	6	74
8	Vipot	23	90	23	86	23	95	23	79	23	84	23	76
9	BioFibra	30	102	30	106	30	119	30	101	30	112	30	102
10	Standard plastic pot - control	7	120	7	117	7	101	7	101	7	101	7	106

Greenhouse Mist Bed

L-R Achicoo, Nutley's Fibre, Nutley's coco, Non-woven and Zeagro

L-R Hairypot, Desch, Vipot, BioFibra and plastic pot

The Zeagro pot on Day 10 showing botrytis on the outer surface of the pot.

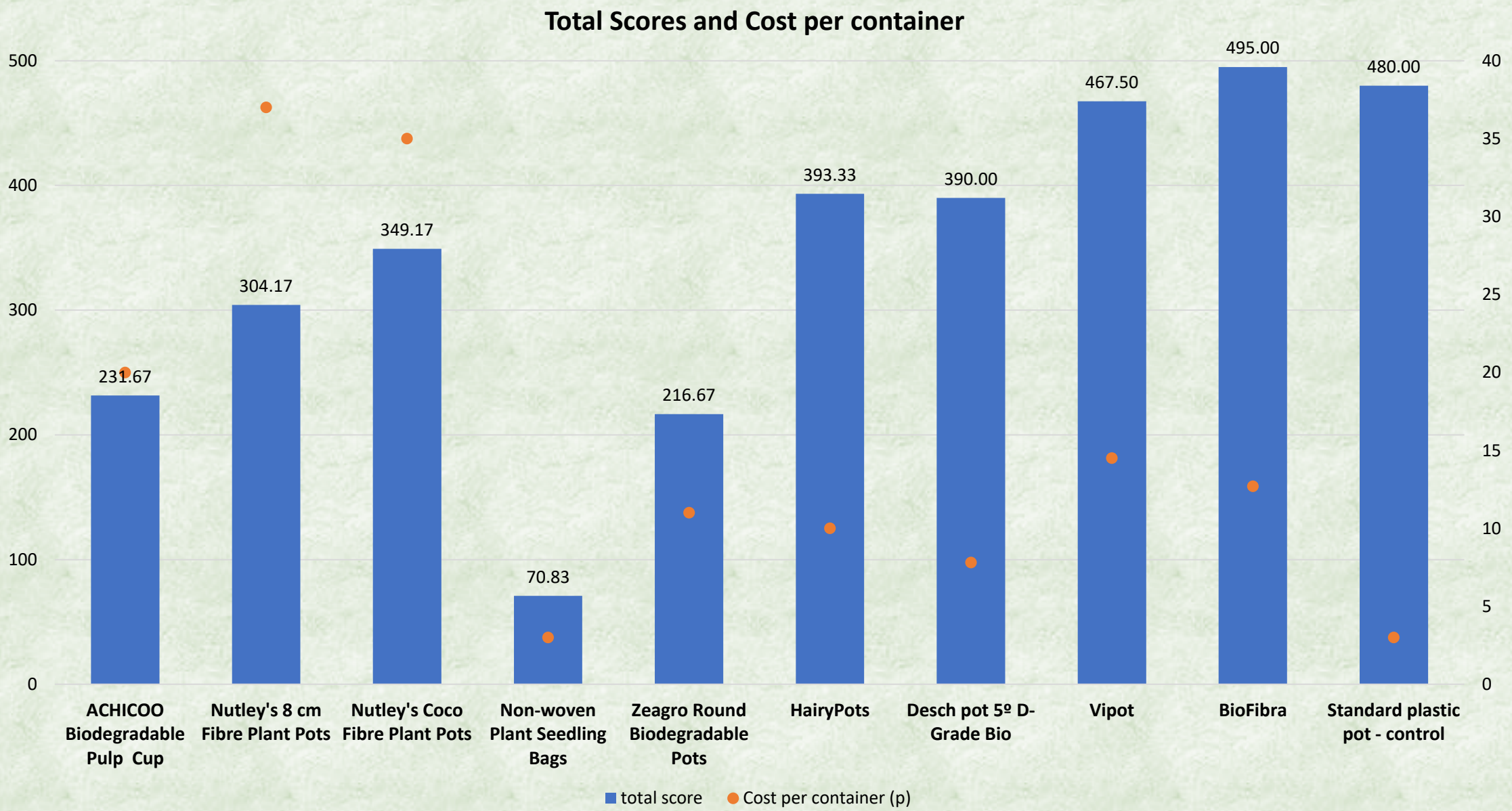
The Achicoo pot when removed from the greenhouse mist bed.

Capillary Matting

L-R Achicoo, Nutley's Fibre, Nutley's coco, Non-woven and Zeagro pots

L-R Hairypot, Desch, Vipot, BioFibra and plastic pot

	Empty Container characteristics		Planted Container characteristics		Empty post-planting
	Handleability	Stability	Handleability	Stability	Condition
ACHICOO Biodegradable Pulp Cup	60	50	50	50	21.67
Nutley's 8 cm Fibre Plant Pots	70	70	60	80	24.17
Nutley's Coco Fibre Plant Pots	80	80	70	80	39.17
Non-woven Plant Seedling Bags	25	0	10	10	25.83
Zeagro Round Biodegradable Pots	55	50	40	50	21.67
HairyPots	80	80	90	80	63.33
Desch pot 5º D-Grade Bio	80	60	70	80	100.00
Vipot	100	100	100	100	67.50
BioFibra	100	100	100	100	95.00
Standard plastic pot - control	95	95	95	95	100.00


Total Scores and Cost per container
500
400
300
200
100
0
40
35
30
25
20
15
10
5
0
231.67
304.17
349.17
70.83
216.67
393.33
390.00
467.50
495.00
480.00
ACHICOO Biodegradable Pulp Cup
Nutley's 8 cm Fibre Plant Pots
Nutley's Coco Fibre Plant Pots
Non-woven Plant Seedling Bags
Zeagro Round Biodegradable Pots
HairyPots
Desch pot 5º D-Grade Bio
Vipot
BioFibra
Standard plastic pot - control
total score
Cost per container (p)

Is there a future for biodegradable pots?

Yes!

The full dissertation can be accessed from https://tinyurl.com/y2szaa7d