

Figure 29: Scatter plot for height on Basil growth for each treatment with Linear regression against time (day). Although the control had strong growth (mean height), the linear modelling suggests the weakest correlation of height to time out of all the treatments. Overall, Peat substrates performed better in regards to crop height with the exception of species K and B, wherein mean height was closely matched to that of peat grown herbs. Use of the mixed species treatment (All species) performed, alongside the Control and species O, worse than species A, B and K.

Table 10: Mean height and standard deviation (*) for Basil in Peat and Peat-Free growing media with Bacterial amendments.

Basil	Days	A	All	B	K	Control	O
Peat	7	-	-	-	-	3.15 (0.86)	-
	14	2.75 (0.39)*	3.85 (5.53)	3.45 (0.48)	2.98 (0.50)	4.74 (2.56)	3.30 (0.62)
	21	5.20 (0.45)	5.30 (0.48)	5.60 (0.55)	5.60 (0.89)	7.30 (1.63)	7.60 (0.89)
	28	-	-	-	-	9.97 (1.65)	-
	32	11.07 (2.27)	10.23 (1.83)	10.17 (1.78)	10.3(1.37)	12.05(3.31)	10.87(1.89)
Peat-Free	7	-	-	-	-	3.14 (0.74)	-
	14	3.47 (0.51)	NaN (NA)	3.42 (0.53)	2.73 (0.49)	4.53 (1.75)	2.75 (0.42)
	21	5.40 (0.55)	2.88 (0.61)	4.40 (1.14)	6.00 (0.71)	6.58 (1.52)	2.60 (0.47)
	28	-	-	-	-	7.12 (1.93)	-
	32	10.30 (0.95)	5.00 (0.00)	11.47 (3.76)	9.90 (1.63)	10.62 (2.58)	7.73 (2.69)

5.3.1.2 Coriander Growth Coriander growth had a significantly lower correlative relationship to time (days) when compared to Basil ($p < 0.01$). However Coriander achieved higher mean height measurements compared to Basil (see Table 11). Differing growth rates were however also expected between crops (see Figure 31). Bacterial treatments demonstrated combiniative treatments (All species mix) increased mean height in both Peat and Peat-Free substrates. These rates were however higher in Peat based substrates. Early growth of (5-7days) coriander seedlings can be seen in Figure 30.

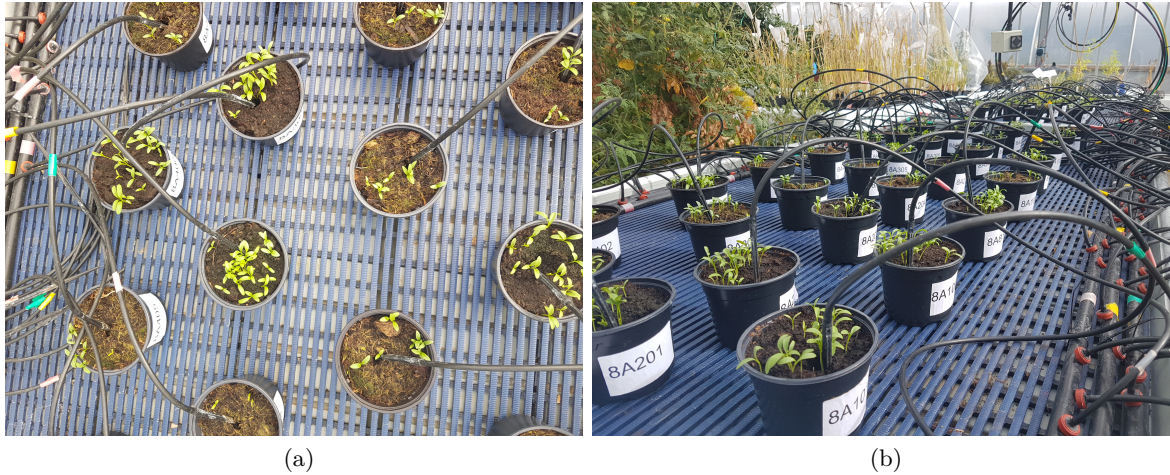


Figure 30: Coriander seedlings at *ca.* 5-7 days growth in Peat and Peat-Free growing media.

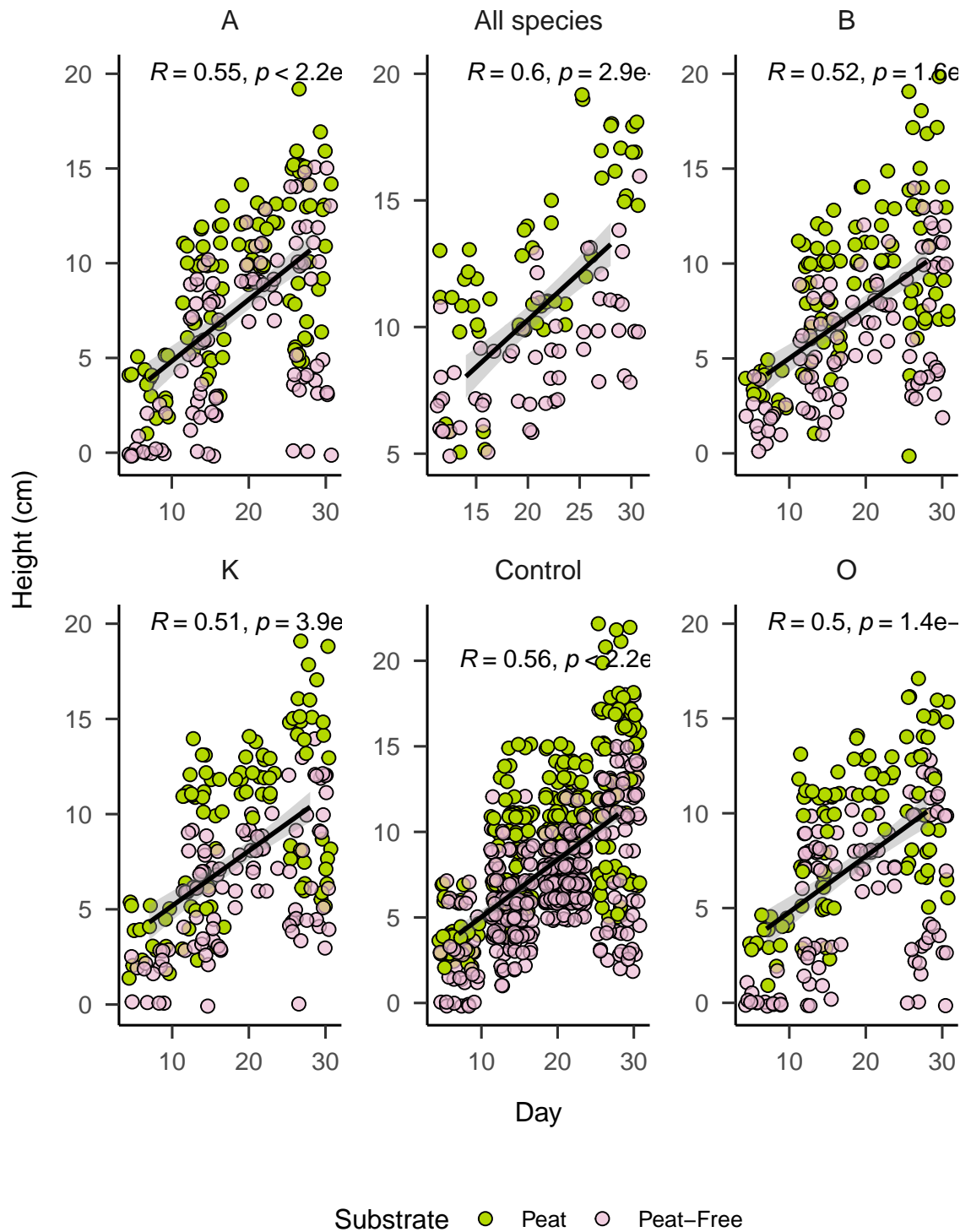


Figure 31: Linear model plot for height on Coriander growth for each treatment. Weaker correlative relationship between crop height and day are demonstrated here when compared to Basil. The All species treatment was the most effective treatment at improving mean height levels and also showed the strongest correlation between height and time(day).

Table 11: Mean height and standard deviation (*) for Coriander

Coriander	Days	A	All	B	K	Control	O
Peat	7	-	3.50 (1.22**)	3.67 (0.79)	3.57 (1.32)	4.05 (1.42)	3.37 (0.99)
	14	8.45 (2.83)	9.72 (2.78)	8.15 (2.83)	8.59 (3.47)	8.65 (2.88)	8.29 (3.06)
	21	11.40 (1.31)	11.58 (1.68)	11.25 (1.74)	12.05 (1.05)	11.40 (1.97)	11.89 (1.29)
	28	11.31 (4.20)	16.47 (1.97)	13.09 (12.24)	11.47 (4.59)	12.38 (4.91)	11.2 (3.8)
Peat-Free	7	0.50 (0.91)	-	1.90 (1.14)	1.70 (1.15)	2.74 (2.20)	0.20 (0.46)
	14	5.19 (3.12)	7.00 (1.49)	5.08 (2.34)	5.41 (2.30)	5.60 (2.31)	5.43 (3.34)
	21	9.40 (1.50)	8.63 (1.95)	7.84 (1.83)	7.80 (1.40)	7.35 (1.60)	7.85 (1.39)
	28	7.98 (4.90)	10.95 (2.15)	7.69 (3.81)	7.61 (3.75)	9.98 (4.54)	7.07(4.52)

5.3.2 Crop Yield

Crop yield was recorded as fresh (time of harvest) and dry (dried for *ca.* 4 days at 40°C). Overall, fresh yield was produced in significantly higher quantities in Peat substrates than Peat-Free (9.67g, 6.86g respectively). While at a crop level, Basil yielded far higher (23.18g, $n = 2,043$) than Coriander (6.38g, $n = 2,105$), $p < 0.001$ (see Figures 33) and 35 for Basil and Coriander mean yields).

On a crop and substrate basis, both Basil (harvestable croppings for Basil and Coriander shown in Figure 32, and 34, respectively) and Coriander grown in Peat yielded significantly ($p < 0.001$) higher than the Peat-Free substrates; Basil, Peat: 28.22g against 18.13g (Basil, Peat-Free) and 7.3g Peat, Coriander vs 5.55g Coriander, Peat-Free (see Tables 12 and 13).

Overall mean fresh yield when accounting for treatments effects were extremely limited by the addition of PGPR's. The control outperformed all other treatments, yielding at 12.63g ($n = 1,869$) against the next best treatment of combined species (A + B + K + O) at 10.34g ($n = 441$). However, addressing mean yield for when accounting for separate substrates, a combinitative treatment of all species with Peat (A + B + K + O) demonstrated higher yields than any other treatment (15.32g).



(a)

(b)

Figure 32: Basil croppings at a late stage of growth. As in any potted herb, crop quality can be determined by many factors, including green leaf area or leaf diameter. The leaf diameter can be an indicator of water stress, nutrient depletion or disease pressure. Basil leaves shown here depict the range of leaf diameter typically found in pot grown basil.