

Question 24 (7 marks)

A researcher conducted a field experiment to determine the effects of planting density on the yield of cauliflowers.

Three planting densities were used:

Treatment A – 20 cm spacing between plants

Treatment B – 50 cm spacing between plants

Treatment C – 80 cm spacing between plants

The researcher prepared 36 trial plots of equal size. Mean yields (grams/cauliflower) for each of the treatments and the position of each plot are shown. The soil texture trend and gradient of the field are also shown.

Gradient								Soil texture	
Top of slope	↓	A	A	A	A	A	A	Sandy loam	Mean yield treatment A $\bar{x} = 1250$ g
		A	A	A	A	A	A		
Mid-slope	↓	B	B	B	B	B	B	Clay loam	Mean yield treatment B $\bar{x} = 1500$ g
		B	B	B	B	B	B		
Bottom of slope	↓	C	C	C	C	C	C	Clay	Mean yield treatment C $\bar{x} = 1850$ g
		C	C	C	C	C	C		

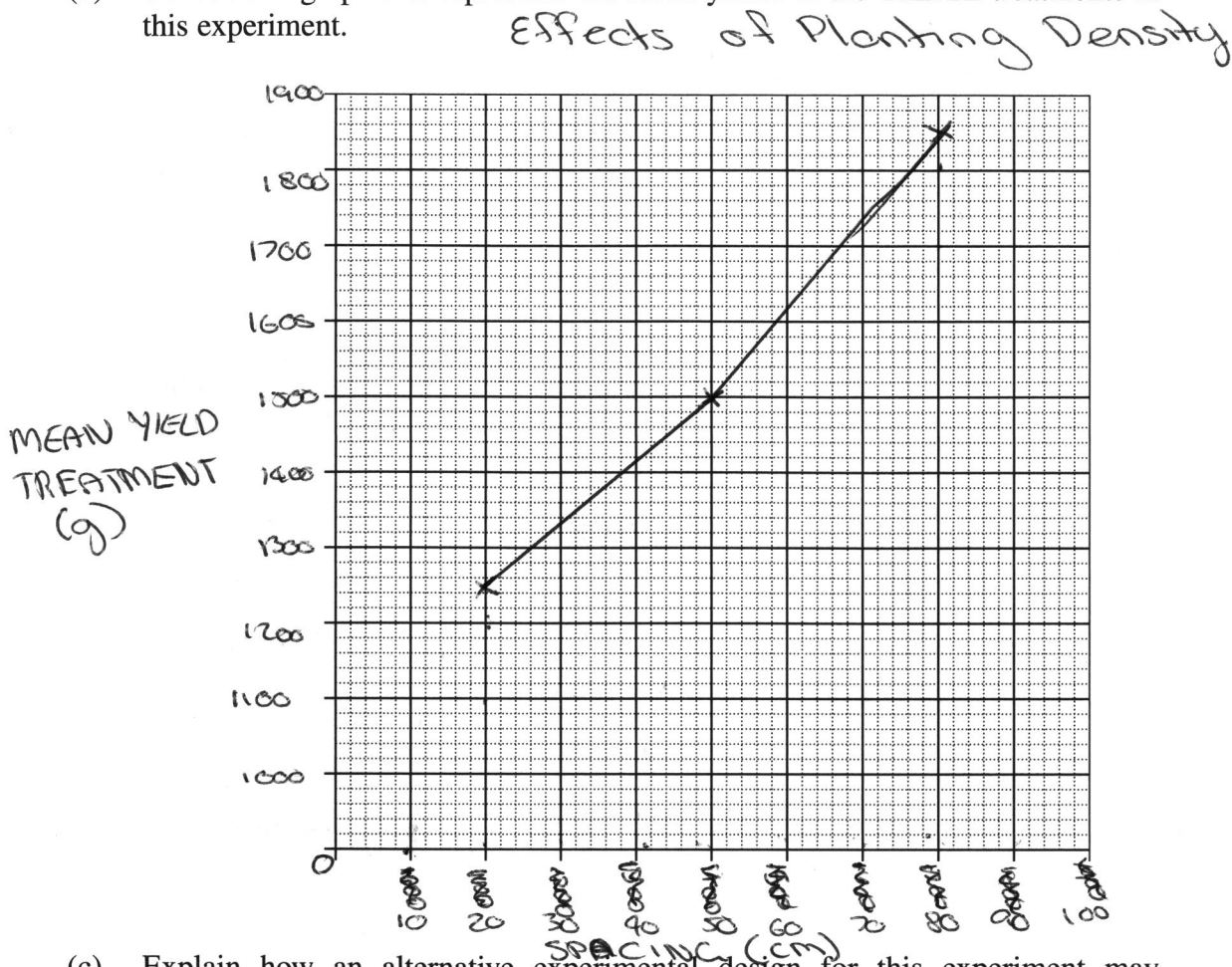
- (a) Which treatment in this experiment is most likely to produce the greatest number of cauliflowers? 1

B as it is clay loam not just sandy loam or clay by itself, it would get some water from the runoff

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Question 24 (continued)

- (b) Construct a graph that represents the mean yields of the THREE treatments in this experiment. 3



- (c) Explain how an alternative experimental design for this experiment may improve the validity of the results. 3

Instead of having "A's" go along the top the "B's" in the middle and "C's" at the bottom they should have two columns of each on the top all the way down to the bottom so some "A's" are in sandy loam, clay loam and clay as well as the B's and C's.

End of Question 24