Student 6: High Not Achieved

NZQA Intended for teacher use only

Faster growing pasture in dairying.

Aim: To find out the optimum growth rate of gibboralic acid when applied to pasture at different quantities over a period of 3-4 weeks. (1)

Hypothesis: I believe that sample 4 0.004L of gibboralic acid will growth the most and produce the heaviest amount of dry matter. I only think his because this sample has the largest amount of gibboralic acid to same amount of water as the other 3 test samples.

This may change though on the weather or the amount of sunlight each sample will get. One sample may be in a shady spot of the paddock. Or there might be a slight change in soil type. E.g one patch might have a different measurement of nitrogen in the soil which will increase the growth rate hugely. I have to be careful choosing a spot in the paddock. I have to be careful of stock as well as they might come into my paddock which will ruin my tests if they happen to eat any grass.

Dependant variable: This is the one that I am going to measure. I am going to measure the weight of dry matter that is in the pasture. Starting with the control. Then doing each other gibboralic sample one after the other. When I have measured each amount of dry matter I will compare it to the controlled test as this one has no amount of gibboralic acid what so ever. To test the dry matter I will cut each sample after 3-4 weeks with the lawn mower. I will catch and collect the cut grass bag it then bring it to school where I will do all my weighing. Firstly to get dry matter I will have to put it either in the microwave or oven to evaporate the water out of it then I will be left with the dry matter which can then be weighed and compared.

Independent variable: The things that I will keep the same. I am going to keep the same location with my test so it is the same soil and grass type throughout my whole test. I will also keep the same volume of water as this may or may not effect the rate that the grass grows. By keeping the amount of water the same it allows this to be an even fair test. The grass length when applying the gibboralic acid will be keeped the same also. I will keep the same area that I am going to sample. It will be 20 patches that are 1.7m x 0.6m.

Controlled variable: This will be the thing that I change. I will change the application rate of the gibboralic acid increasing the rate by 0.1 each time.
4 will be a controlled test.
4 will be 0.001L of gibboralic acid.
4 will be 0.002L of gibboralic acid.
4 will be 0.003L of gibboralic acid.
4 will be 0.004L of gibboralic acid.

Control: Will be 0g of gibboralic acid which it won't be applied to one sample of 4.
Recommendation: This is the recommended rate that is suggested to be applied to a $1m^2$ patch of grass. This is the closes area I can get to mine of 1.7m x 0.6m. Each sample will have a range of 4 so every sample will have a fair chance at growing. Each sample will have the same growth period of 3-4 weeks.

Method: I am going to have 20 different strips of grass that will be 1.7m x 0.6m in total (approximately the mower width). The grass will be cut all the same lengths so it will be a fair test. My range will be 4 ranging from 0.001L to 0.004L. Each sample will have 4 different patches that will have the same rate. (2)

When I cut the grass I will weigh the dry matter so i can calculate the increase of dry matter that has come from applying the gibboralic acid.

After 3-4 weeks I will cut each sample of grass and measure the dry matter which is produced. I will compare it to my controlled patches that I am going to have.

I will apply my gibboralic 1-5days after cutting my grass. Growth stimulation should be seen after 7 days and cease after 3-4 weeks.

Stock solution:
A) 5L water : 0.5g of progib (gibberellic acid) : 5mls of country mile organ silicone.

B) 5L water : 1g of progib (gibberellic acid) : 5mls of country mile organ silicone.

C) 5L water : 1.5g of progib (gibberellic acid) : 5mls of country mile organ silicone.

D) 5L water : 2g of progib (gibberellic acid) : 5mls of country mile organ silicone.

Pasture Preparation: When we finished our solutions I went home to prepare my plots for the test to do this I used the lawn mower, the width of the lawn mower blade was ideal. I worked out that the mower blade width would be what the width of my plots would be. This way it would be much easier for me to cut each section easierly. It also works out easier when I want to cut it as I just have to go over the same ground once to get my results. I got home I measure out the length I wanted then rode the mower over it. My length 6.8m which I then divided up into 4 1.7m sections. I had to do this 4 times as I need 4 different results to make it a fair test and to test the optimum growth of a different solution. When I finished doing that I had to collect the cut grass and weigh the dry matter so when it comes to weighing the dry matter when we finish the test we can not only compare it to each different sample but to the original weight of the grass. I started out measuring my plots and cutting the grass for the first initial cut before I would apply progib. I did this a week before tournament week so I was away for a whole week so i did not actually manage to apply my progib, so I got the results from another group which did it similar to me.

Results:

Wet weights:

	1	2	3	4	Average
0	122g	103g	154g	124g	503/4 = 125.75g
1	117g	91g	144g	223g	575 / 4 = 143.75g
2	98g	141g	110g	133g	482 / 4 = 120.5g
3	200g	117g	82g	229g	628 / 4 = 157g
4	172g	99g	111g	137g	519 / 4 = 129.75g

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0,4 = 36g dry (0,3) + (0,1) = 66g dry

Average dry matter percentage (36+66) / (122+154+124) x 100/1 = 25.5% DM

Conclusion: We found out form the data I help collect that Solution 3 was the best productive wise as it produced more dry matter than any other solution. Solution 2 was the recommended rate of application for progibb. When comparing this to the control (no gibberalic acid) we found that the recommended rate of 1g to 5L of water was below the actual normal growth percentage. So it works out to be poorer. Also stock solution 4 had 3 times the amount of giberalic acid as stock solution 1 and it produced poorer. Producing a little over average than the control pasture.

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Our best productivity was 200g wet weight of pasture. This is 78% better production than was the control method from the same column is. Solution 3 (5L water : 1.5g of progib (gibberellic acid) : 5mls of country mile organ silicone) was 24% better than the control. This was the biggest percent change. Solution 2 (5L water : 1g of progib (gibberellic acid) : 5mls of country mile organ silicone) was a 5% decrease and this was the recommended rate for the original application.

Discussion: Our results we found were interesting as we did not think that our results would prove that the infact recommended rate was poorer than the control where there was no giberalic acid applied. We thought that our results would prove that the more giberaliic acid would produce more growth. So we all thought that solution 4 would produce the highest amount of growth. Where is fact solution 3 was the highest producer and the recommended rate of 1g of progib produced the poorest. These results could be different because of different soil types etc but all samples were done with in 1 metre radius of each other so should not be different. All solutions are the same with the same amount of water and the same amount of Country Mile Organ Silicone. The only change is half a gram of progib which increased for each solution. We were all amazed in the outcome of our results as they were not what we were expecting. Massey University ran a trial on Progibb. Their results showed that there is an increase of pasture growth but it does not tell us how much progib was applied to this pasture. It was an increase DM/ha weight of +195kg, which sounds like a significant amount of growth. It shows that urea alone produces a higher growth than progib. I suspect they are the same amount applied for both. And progib plus urea provides an even bigger increase of growth. This is a trail for a suggestions for farmers if they want an optimum growth rate.

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