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| **Introduction Page 3**  "*Caffeine increases growth of Rye Grass � plant growth increases with the use of coffee as the hydrating element vs. the use of ordinary tap water.*"7  The quote above shows that someone have already done a research on the growth of Rye grass and the results showed that it grows better with caffeine. If I will make an experiment by myself, I will know for sure if watering plants with caffeine will help them to grow or will not have a great impact on their growth.  "*Studies show that plants watered with caffeinated coffee grow better than control plants watered with water."*8  This statement just supports the one made before � it shows that someone made an experiment on watering plants with caffeine solution and the results appeared to be so that caffeine really does influence the growth of plants in a positive way.  "*There are two thoughts on the idea, but no one really knows for sure. One study (Frischknect et.al. 1985) believes that caffeine protects plants from insect or fungal attacks. Another study (Friedman & Waller 1983) believes that caffeine excreted by the plant into the soil surrounding it reduced growth of competing plants and bacteria."*9  Here is another opinion about protection of plants from insects by putting caffeine in the soil. It is already second time I meet this kind of statement during my search on "caffeine and plants" topic. But my area will cover the influence of caffeine on metabolism of plants � exactly how tall they grow and how large their leaves will grow, to see if caffeine makes plants grow larger. After completing my experiment I can investigate other branches in this area, for example � to see if adding caffeine to the soil changes the amount of insects that live on the given plant. But then I will have to choose some plant that is being damaged by insects a lot � like potato or tomato, so my experiment will show if plants that are grown in caffeine solution will be damaged less than the ones being watered with a regular water.  As you can see, there are many interesting things about caffeine influencing plants. Then, why not to investigate it? Indeed, if I will have a successful experiment ant it will appear that plants grow better when I water them with caffeine solutions rather than with regular water, then we can be watering plants with caffeine, and get much higher harvests on our fields, expand our economy in some way, and moreover � expand our knowledge in the field of metabolism of plants. Further we can investigate why caffeine causes similar effects on metabolism of plants as it does on metabolism of humans, and what do humans and plants have in common that caffeine is so much attracted to? On the other hand � if my experiment will show that caffeine doesn�t make plants grow better, but makes them die, we will know for sure that there in no use of watering plants with caffeine, because it will just kill them.  Summarizing all the information discovered during the search, we can see the clear outline:  - molecule of caffeine is similar to the one of adenine, which is found in DNA and ATP � two very important components of the plant life  - molecule of caffeine replaces the molecule of calcium and could be used instead of calcium to cause similar effect on plants as calcium does  - protection of plants from insects and diseases by adding caffeine to the soil  Therefore, we can use caffeine as a part of a fertilizer. It could be an expensive  fertilizer, but there is always a way to work things out. For example � used coffee still has some caffeine in it and if it can be added to the fertilizer, it will be not that expensive. If my experiment will support my hypothesis, then we could get a lot more from our harvests. Of course then we would have to study all the side effects, because each plant is individually unique, and it doesn�t mean that if it has a good effect on one plant, then it will have a good effect on any plant.  After some analysis I have started an experiment. I chose to use *brewed coffee* because the caffeine content in it is not very large *(80-135)* in compare with *espresso (100) and drip (115-175)* . In brewed coffee the 25% solution of it will be relatively small and not as large as if I would of chosen the coffee that has huge caffeine content in it and 25%, 50%, 75% and 100% caffeine solutions of it would be still very strong for plants � making it too much. But 25% of brewed coffee will be different from the 50% and so on. I don�t really know which concentration will be effective, so I chose four different concentrations: 25%, 50%, 75% and 100%. Noting that the coffee I chose � "*Columbia Supreme" has 1.37% caffeine in its beans and blends."*10  I took 50 mg of coffee and 500ml of water and made brewed coffee, and counted the proportion 50mg/500ml as 100%. Then by adding water I was able to get other concentrations, like � 25%, 50%, and 75%. The controlled plants should be grown without caffeine in it, so I will have data to compare it with. The only changing variable is that plants are being watered with different caffeine concentration solutions, and the controlled ones are taking water. The rest of them are the same unchangeable conditions. Each sample size contains 10 pots with plants that all get the same amount of hydrating solution. The 25% ones have 16 pots and each one of them gets the equal share of watering solution. The radish was chosen to be the object of an experiment because it is a fast growing plant and it is a vegetable � so the experiment can be of use � fertilization of the soil. The seeds are 2-3 mm long, were planted, and within a certain amount of time when the plants reached a certain height, I started to water them with caffeine solutions. The coffee was kept closed in a dry place, to prevent it from spoiling, and fresh coffee was made every week so it is always fresh for plants and it was kept in plastic bottles. The project itself will take 5 weeks - 5 times of data collection, and the results will be carefully examined, recorded, analyzed and discussed in class with the students and the teacher.  In my project I want to see if caffeine really does influence the growth rate of plants, and if it does, then how does it influence it. Also � all the other noticed changes in plants will be recorded, so they can be investigated further in other experiments.  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