

***Effect of Human Hair on Lablab purpureus Plant
Growth-(Male vs Female)***

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*Effect of Human Hair on *Lablab purpureus* Plant Growth-(Male vs Female)*

ABSTRACT

Plants need nitrogen to grow healthy stems and leaves. Although nitrogen is the most abundant element in the air we breathe, that form of nitrogen cannot be used by plants. Nitrogen contained in fertilizer, on the other hand, is readily taken up by plants.

Human hair discarded from barbershops and hair salons can be a nitrogen source for plants when combined with other compost materials. The plants seem to be able to use about 50 percent of the nitrogen contained in the hair. I used hair as the nitrogen fertilizer because human hair contains vast amounts of nitrogen, and when mixed with soil, makes a great nitrogen boost in an eco-friendly way.

This project is to compare effectiveness of male and female hair in inducing plant growth. For this project, I collected male hair and female hair of two different ages groups (below 15 and above 15) from hair salons and parlour. Before proceeding, I cut all the hair separately for faster decomposition. Garden soil was used as the growth medium for the plant because it has more fertility. I used cow dung as the co-fertilizer for helping the hair in fixing Nitrogen. I mixed 20kg of soil with 2kg of dried cow dung in an even manner. From that mixture, I had taken 1650g and added to all the pots (13 pots). Leguminous plants contain root nodules and it will help to fix nitrogen from the hair to the soil. So I selected *Lablab purpureus* plant from Fabaceae family. Seed of *Lablab purpureus* was soaked to test the seed quality. I varied the amount of hair used for the plants (10g, 25g, and 40g) to determine which amount of hair of which type will help the plant to grow faster. I had sown 5 seeds of *Lablab purpureus* for each pot. I irrigated all the pots equally as 150ml of water. I noted the length of plant and leaves and then tabulated.

I found the plants grown in **Male below 15hair type** was better than others and the **Female above 15** seems to have lower plant height. The only Exception was in case of weight 40 g.

- **Male Below 15 > Male Above 15 > Female Below 15 > Female Above 15**
- **Female Below 15 > Male Above 15 > Male Below 15 > Female Above 15**

Results from my study suggest that **Male hair** waste could be effectively used as a nutrient source for container-grown plants.

INTRODUCTION

We all know plants need water and sunlight in order to grow. In addition to that, plants need certain nutrients to grow, particularly nitrogen. While nitrogen is abundant in the Earth's atmosphere (composing about 78 percent of it), it is in the form of molecular nitrogen (two nitrogen atoms bonded together), which is unusable to plants.

For plants to take up nitrogen, it must be "fixed" into compounds such as nitrate (one nitrogen and three oxygen atoms), which plant roots can absorb from the soil. While some plants, such as legumes, get their nitrogen through symbiotic relationships with nitrogen-fixing bacteria, others rely on fertilizers, whether organic (composted plant waste or animal manure) or inorganic.

Nutrients necessary for plant growth:

In order for a plant to grow and thrive, it needs a number of different chemical elements. The most important are:

- Carbon, hydrogen and oxygen - Available from air and water and therefore in plentiful supply
- Nitrogen, phosphorus, potassium - The three **macronutrients** and the three elements can be found in most packaged fertilizers
- Sulfur, calcium, and magnesium - Secondary nutrients
- Boron, cobalt, copper, iron, manganese, molybdenum and zinc - Micronutrients



If any of the macronutrients are missing or hard to obtain from the soil, this will limit the growth rate for the plant. Nitrogen is one of the important macronutrients because it is necessary for basic building blocks. Every amino acid contains nitrogen. In nature, the nitrogen often comes from the decay of plants that have died. In the case of nitrogen, the recycling of nitrogen from dead to living plants is often the only source of nitrogen in the soil.

Fertilizers

Plants need nutrients to grow and fertilizers are a good source of nutrients that may be lacking in the soil. However too much of anything is not a good thing. Plants absorb water from the soil into the roots through a process called osmosis. This process will require the salt content inside the roots to be higher than the salt content of the soil. As a result, the water molecules will migrate from the soil into the roots in order to balance the salt level in the soil and in the roots.

Using too much fertilizer will increase the salt content of the soil. If the salt content of the soil becomes higher than the salt content of the roots, the water molecules will migrate out of the root into the soil causing root burn. This will cause the plant to grow more slowly, become dehydrated and eventually die.

Too little fertilizer will cause the plants not being able to grow at the optimal speed due to the lack of nutrients in the soil. Therefore using the correct amounts of fertilizer recommended by the manufacturer is the safest way for the plants to grow healthily.

Chemical Fertilizers

Chemical fertilizers (also called inorganic, synthetic, artificial, or manufactured) have been refined to extract nutrients and bind them in specific ratios with other chemical fillers. These products may be made from petroleum products, rocks, or even organic sources. Some of the chemicals may be naturally occurring, but the difference is that the nutrients in chemical fertilizers are refined to their pure state and stripped of substances that control their availability and breakdown, which rarely occurs in nature.

Disadvantages of chemical fertilizers:

- They grow plants but do nothing to sustain the soil. The fillers do not promote life or soil health, and even packages labelled “complete” do not include the decaying matter necessary to improve soil structure.
- In fact, chemical fertilizers don’t replace many trace elements that are gradually depleted by repeated crop plantings, resulting in long-term damage to the soil.
- Because the nutrients are readily available, there is a danger of over fertilization. This not only can kill plants but upset the entire ecosystem.
- Long-term use of chemical fertilizer can change the soil pH, upset beneficial microbial ecosystems, increase pests, and even contribute to the release of greenhouse gases.
- Chemical fertilizers are more expensive than natural fertilizers.
- They may contain ingredients that may be toxic to the skin or respiratory system.

Organic Fertilizer:

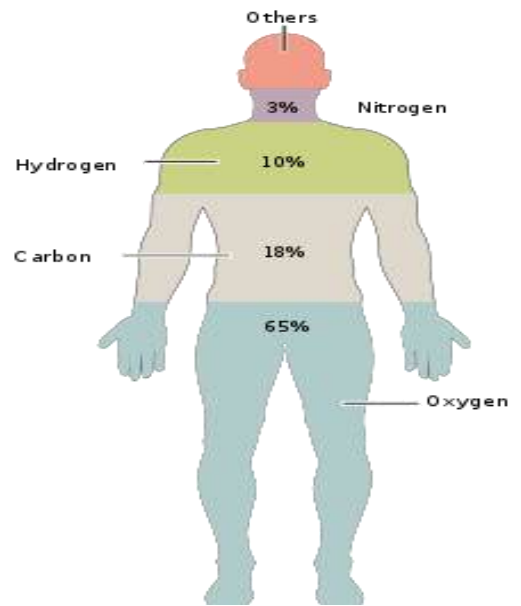
The words “organic” or “natural” in this case simply means that the product is only minimally processed, and the nutrients remain bound up in their natural forms, rather than being extracted and refined. In the case of fertilizer, “organic” does not refer to the standards of processing associated with food.

Organic fertilizer is usually made from plant or animal waste or powdered minerals. Examples include manure and compost, as well as bone and cottonseed meal. They are usually sold as “soil conditioners” rather than as fertilizer, because the nutrient ratios are difficult to guarantee. Organic fertilizers may be processed in a factory, or, in the case of manure and compost, at a farm. Organic fertilizers are renewable, biodegradable, sustainable, and environmentally friendly.

Human hair as organic fertilizer to plants:

Human hair contains vast amounts of nitrogen, and when mixed with soil, makes a great nitrogen boost in an eco-friendly way. In contrast to other forms of nitrogen, hair is slow to degrade, so

it releases the nitrogen over a long period of time, meaning less times you have to manually treat the soil with nitrogen. Haircut could be turned into crop fertilizer.



The plants seem to be able to use about 50 percent of the nitrogen contained in the hair. Once the degradation and mineralization of hair waste starts, it can provide sufficient nutrients and ensure similar yields to those obtained with the commonly used fertilizers in horticulture. Using uncomposted hair can help improve poor quality soil by slowly releasing nutrients and nitrogen into the soil. The hair can also provide structural support for roots and help break up thick or clay soil.

The only catch is that the hair takes a while to start decomposing and releasing nutrients into the soil, so it has to be paired with more fast-acting fertilizers.

Nitrogen fixation:

Biological nitrogen fixation is a free and environmentally benign process through which biologically useful Nitrogen can be generated for plant growth.

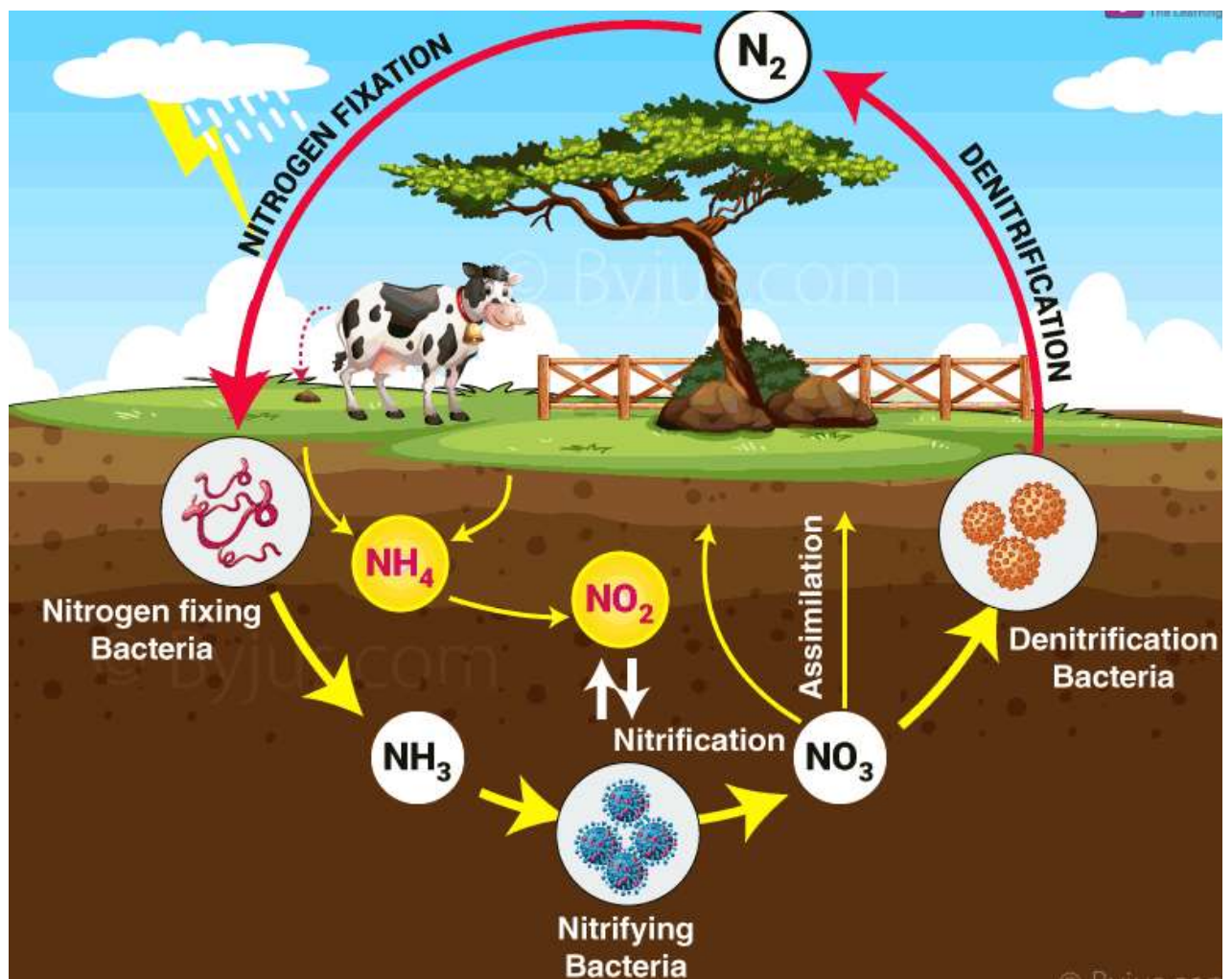
Nitrogen fixation is a process by which molecular nitrogen in the air is converted into ammonia (NH_3) or related nitrogenous compounds

in soil. Atmospheric nitrogen is molecular di-nitrogen, a relatively nonreactive molecule that is



metabolically useless to all but a few microorganisms. Biological nitrogen fixation converts Nitrogen (N_2) into ammonia, which is metabolized by most organisms.

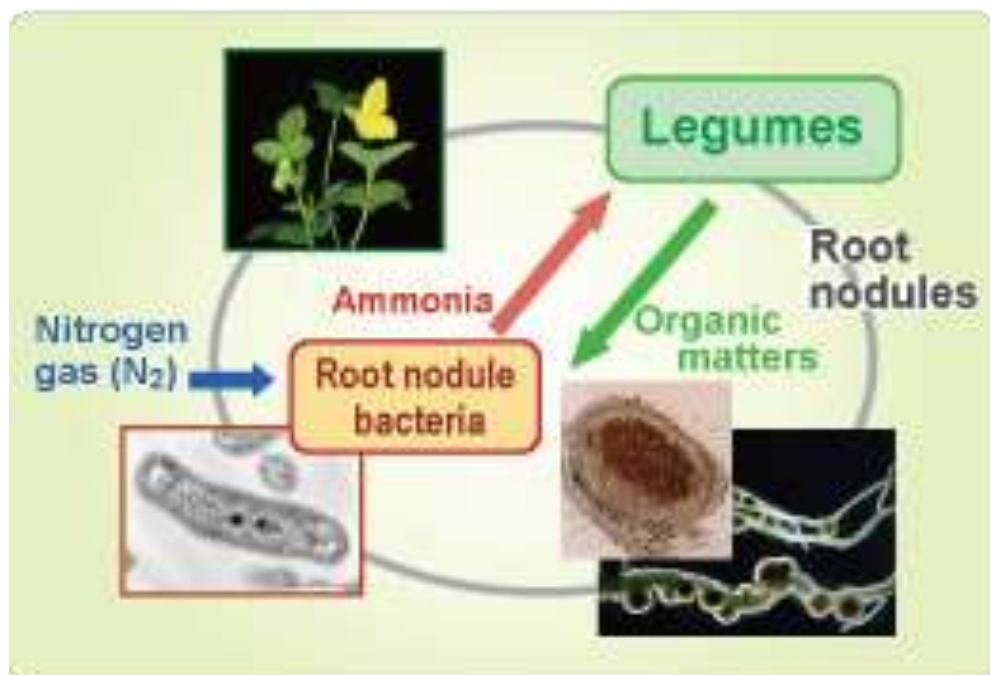
Nitrogen fixation is essential to life because fixed inorganic nitrogen compounds are required for the biosynthesis of all nitrogen-containing organic compounds, such as amino acids and proteins, nucleoside triphosphates and nucleic acids. As part of the nitrogen cycle, it is essential for agriculture and the manufacture of fertilizer.



Characteristics of leguminous plants:

- Legumes exhibit great diversity, comprising approximately 700 genera and over 18,000 species. Leguminous crops such as soybean, kidney bean, and red bean are cultivated in various regions all over the world, and are considered as second important crops after gramineous crops such as rice, wheat, and corn.

- Leguminous crops are consumed as foods and forages or used as raw materials for the production of various processed products such as oils, fats, and soy sauces.



- Legumes have the ability of symbiotic nitrogen fixation that contributes to sustainable agriculture, thereby lowering the environmental burden. Symbiotic nitrogen fixation is a mutual phenomenon. Nodular bacteria (*i.e.*, soil bacteria) in the organ called a root nodule on the root of legumes synthesize ammonia from atmospheric nitrogen and supply this ammonia to the host. In return, the host supplies these bacteria with carbohydrates and photosynthetic products.
- Since legumes can grow in soil with less nitrogen content by performing symbiotic nitrogen fixation, they contribute greatly to the prevention of environmental pollution caused by excessive use of nitrogenous fertilizers and save the energy required to produce and transport nitrogenous fertilizers. Therefore, much effort has been directed toward introducing nitrogen-fixing ability in gramineous crops and industrial plants.

STATEMENT OF THE PROBLEM

Many of us are aware of the organic fertilizers prepared from the vegetable and fruits wastes. But, what about the waste products from the humans? Nowadays hair-fall is very common for most of the people which impose the hair as the waste biological product. Instead of labelling as waste, hair could be given a greater position in horticulture as it is the potential organic fertilizer for plants. This is because of the presence of nitrogen in proteins which will be fixed by the soil microbes and that will induce the plant growth. I wish to do this project to suggest human hair can be used as the fertilizer for the plants and I also want to determine the optimum quantity of which type of hair will induce more growth in the case of leguminous plants.

HYPOTHESIS

Male hair of age group below 15 will give comparatively better plant growth.

DESIGN OF STUDY

INDEPENDENT VARIABLE:

- Human Hair (Male hair and Female hair-Above 15 & Below 15 Age group)

DEPENDENT VARIABLES:

- Rate of the plant growth (height of the plant, number of leaves, size of leaves)

CONTROLLED VARIABLES:

- Quantity of hair
- Type of plant
- Type and amount of soil
- Type and amount of manure
- Amount of water
- Number of seedlings in a pot

MATERIALS:

- Earthen Pot (13 pots)
- Male and Female hair of age group below 15 and above 15
- Soil (20 kg)
- Water (tap water)
- Manure cow dung (2 kg)
- Digital weighing machine
- Measuring cup
- Measuring scale
- *Lablab purpureus* seeds
- Data table
- Scissors
- Labelled bowls/tray for keeping cut hair

PROCEDURE:

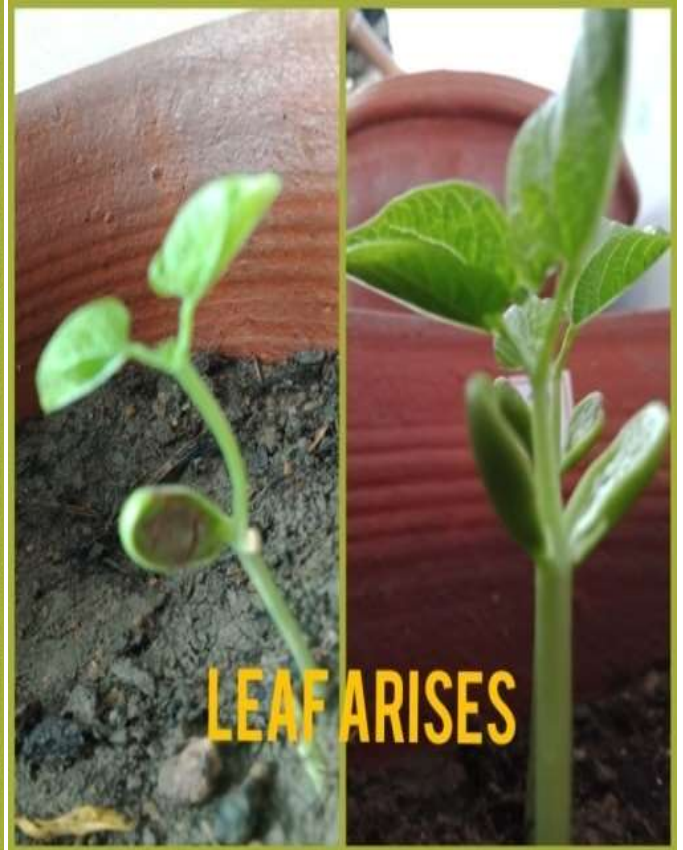
- Collect all the needed materials.
- Select 13 earthen pots for plantation.
- Label the pots as follows:
 - ✚ Control,
 - ✚ Male <15 -10g, Male <15 - 25g, Male <15 - 40g,
 - ✚ Male >15 -10g, Male >15 - 25g, Male >15 - 40g
 - ✚ Female <15 -10g, Female <15 - 25g, Female <15 - 40g
 - ✚ Female >15 -10g, Female >15 - 25g, Female >15 - 40g
- Plough and mix 20kg of the soil collected from school garden for uniform distribution of air and minerals.
- Weigh 2kg of sun-dried cow dung and mix with the soil to make 1:10 proportion.
- Measure 1650g from soil-manure mixture and pot it into the 13 earthen pots.
- Cut the collected hair into small pieces.
- Add 10g, 25g, and 40g of Male and Female hair into the respective labeled pots and mix everything evenly.
- Soak the seeds of *Lablab purpureus* seeds in the water for half an hour and for testing their quality. Those seeds which get sink in the water will be more suitable for planting.
- From the selected ones, place five seeds in each pot. Make sure that the soil in each pot is damp.
- Irrigate the soil with equal amount of water (150ml) to all the pots.
- Let the pots set on under sunlight.
- Add approximately 150ml of water every day.
- Record the height of the stem, length of the leaf, number of leaf of each seed plant everyday at a certain time of the day. Snap the pictures for each day.

COLLECTION OF DATA- PHOTOGRAPHS











TABULATION- EFFECT OF HUMAN HAIR ON PLANT GROWTH OF *Lablab purpureus* (MALE VS FEMALE)

TABLE 1A: CONTROL(Length of the plant without hair addition)

Seeds	Length of the plant (in cm)												
	Day 1	Day 3	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 12	Day 13	Day 14	Day 15	Day16
Seed 1	0	0	7.6	12.2	15.1	17.2	18	18.2	18.4	18.7	19	19.3	19.3
Seed 2	0	0	7	11.6	16.1	17.6	19.1	19.4	19.6	19.6	19.7	19.8	19.9
Seed 3	0	0	6.3	10.5	14.4	15.3	16.1	16.2	16.6	16.8	17.4	17.6	17.6
Seed 4	0	0	0	0	0	0	0	0	0	0	0	0	0
Seed 5	0	0	0	0	0	0	0	0	0	0	0	0	0

Seeds	Length of the plant (in cm)														
	Day23	Day 26	Day 27	Day 28	Day 29	Day 30	Day 33	Day 34	Day 35	Day 38	Day 39	Day 40	Day 41	Day 42	Day 47
Seed 1	19.6	19.7	19.8	19.8	19.9	0	0	0	0	0	0	0	0	0	0
Seed 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seed 3	17.7	17.7	17.9	17.9	17.9	17.9	0	0	0	0	0	0	0	0	0
Seed 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seed 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 1B: CONTROL (Length of the leaves without hair addition)

<i>Seeds</i>	<i>Length of the Leaves (L1, L2, L3,...) (in cm)</i>											
	<i>Day 1</i>	<i>Day 3</i>	<i>Day 5</i>	<i>Day 6</i>	<i>Day 7</i>	<i>Day 8</i>	<i>Day 9</i>	<i>Day 10</i>	<i>Day 12</i>	<i>Day 13</i>	<i>Day 14</i>	<i>Day 15</i>
<i>Seed 1</i>	0	0	1.7	2.0	2.6	3.3	3.7	4	4	4	4.1	4.1
			1.5	2.2	3.1	3.6	4.1	4.1	4.1	4.1	4.1	4.2
<i>Seed 2</i>	0	0	1.9	2.1	2.2	2.3	2.3	2.4	2.5	2.5	2.6	2.7
			1.8	2.6	3.5	4.2	4.8	4.8	4.8	WR	WR	WR
<i>Seed 3</i>	0	0	2.1	2.8	4.5	4.6	5	5.8	5.2	5.3	5.4	5.6
			2.4	2.8	4.0	4.7	4.9	5	5	5.1	5.3	5.3
<i>Seed 4</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0

<i>Seeds</i>	<i>Length of the Leaves (L1, L2, L3,...) (in cm)</i>															
	<i>Day 16</i>	<i>Day23</i>	<i>Day 26</i>	<i>Day 27</i>	<i>Day 28</i>	<i>Day 29</i>	<i>Day 30</i>	<i>Day 33</i>	<i>Day 34</i>	<i>Day 35</i>	<i>Day 38</i>	<i>Day 39</i>	<i>Day 40</i>	<i>Day 41</i>	<i>Day 42</i>	<i>Day 47</i>
<i>Seed 1</i>	4.4	4.7	4.9	4.9	WR	WR	WR									
	4.6	4.9	5.1	5.1	5.2	5.5	0									
	0.6	1.1	1.2	1.3	1.4	1.5	0	0	0	0	0	0	0	0	0	0
	1.2	2.6	2.8	2.9	2.9	2.9	0									
<i>Seed 2</i>	2.7	0														
	WR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Seed 3</i>	5.6	5.7	5.8	5.9	5.9	5.9	5.9									
	5.4	FELL	FELL	FELL	FELL	FELL	FELL	0	0	0	0	0	0	0	0	0
<i>Seed 4</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 2: EFFECT OF MALE <15 HAIR ON THE GROWTH OF *Lablab purpureus***TABLE 2A: EFFECT OF MALE <15 HAIR ON THE LENGTH OF THE PLANT**

<i>Weight of Hair</i>	<i>Seeds</i>	<i>Length of the plant (in cm)</i>												
		<i>Day 1</i>	<i>Day 3</i>	<i>Day 5</i>	<i>Day 6</i>	<i>Day 7</i>	<i>Day 8</i>	<i>Day 9</i>	<i>Day 10</i>	<i>Day 12</i>	<i>Day 13</i>	<i>Day 14</i>	<i>Day 15</i>	<i>Day 16</i>
10 g	<i>Seed 1</i>	0	0	12.3	15.9	18	20	20.6	20.6	21.6	21.9	21.9	21.9	21.9
	<i>Seed 2</i>	0	0	8.5	12.6	16	18.2	20	20.1	21.6	21.7	21.9	21.9	21.9
	<i>Seed 3</i>	0	0	6.1	10.3	13.8	16.2	17.9	18.6	19.7	19.9	19.9	19.9	20
	<i>Seed 4</i>	0	0	1.5	8.1	14.1	17.6	19.2	20.1	21	21.1	21.2	21.3	19.9
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0
25 g	<i>Seed 1</i>	0	0	7.4	12.1	15.9	18.8	21.6	23.3	25.1	25.6	25.8	25.9	26
	<i>Seed 2</i>	0	0	7.5	9.5	12.6	14.2	15.6	15.7	17	17.1	17.2	17.5	17.7
	<i>Seed 3</i>	0	0	5.5	7.4	9.1	10	11	11.1	13.1	13.3	13.4	13.5	13.9
	<i>Seed 4</i>	0	0	5.5	6.4	7.6	8.1	8.6	8.6	9	9.1	9.3	9.5	9.8
	<i>Seed 5</i>	0	0	0.7	1.9	3.6	5.1	7.6	8.1	11.1	11.3	11.4	11.6	11.9
40 g	<i>Seed 1</i>	0	0	10.3	15.6	17.8	19.6	21	21	21.1	21.3	21.4	21.6	21.8
	<i>Seed 2</i>	0	0	10.1	15	17	19.6	21	21	21.1	21.4	21.6	22	22.1
	<i>Seed 3</i>	0	0	6.8	11	15.5	18	21.1	21.2	22.3	22.3	22.6	22.7	22.8
	<i>Seed 4</i>	0	0	6	10.3	13.6	16	17.5	18	19.1	19.2	19.3	19.4	19.3
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0

<i>Weight of Hair</i>	<i>Seeds</i>	<i>Length of the plant (in cm)</i>														
		<i>Day23</i>	<i>Day 26</i>	<i>Day 27</i>	<i>Day 28</i>	<i>Day 29</i>	<i>Day 30</i>	<i>Day 33</i>	<i>Day 34</i>	<i>Day 35</i>	<i>Day 38</i>	<i>Day 39</i>	<i>Day 40</i>	<i>Day 41</i>	<i>Day 42</i>	<i>Day 47</i>
10 g	<i>Seed 1</i>	22.1	22.3	22.5	22.6	22.7	22.9	30.8	30.9	30.9	40.1	40.1	40.2	40.2	40.2	40.5
	<i>Seed 2</i>	22.1	22.5	22.7	22.8	22.9	22.9	30.1	30.2	30.5	30.7	30.7	30.8	30.9	30.9	40.2
	<i>Seed 3</i>	15.3	15.5	15.9	15.9	15.9	16	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9
	<i>Seed 4</i>	20.3	20.4	20.5	20.6	20.7	20.7	20.8	20.9	21.1	21.4	21.6	21.7	21.8	21.9	22.9
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25 g	<i>Seed 1</i>	27.1	27.3	27.5	27.6	27.7	27.9	30.2	30.3	30.5	30.8	30.9	40.1	40.3	40.4	42.6
	<i>Seed 2</i>	20.1	21.5	21.7	21.8	21.9	21.9	22.3	22.4	22.6	22.8	22.9	23.2	23.5	23.8	23.9
	<i>Seed 3</i>	27.8	27.9	27.9	27.9	28.1	28.3	28.5	28.5	28.7	28.9	28.9	29	29.1	29.2	31.5
	<i>Seed 4</i>	19.1	19.3	19.5	19.6	19.7	19.7	19.8	19.9	19.9	20.3	20.5	20.6	20.7	20.8	20.9
	<i>Seed 5</i>	20.3	20.4	20.5	20.6	20.7	20.8	20.8	20.9	21.1	21.5	21.6	21.7	21.8	21.9	22.9
40 g	<i>Seed 1</i>	23.6	23.7	23.9	24.2	24.3	24.4	24.5	24.6	24.6	24.6	24.7	24.8	24.9	24.9	25.5
	<i>Seed 2</i>	7.6	7.8	7.9	7.9	8.1	8.1	8.2	8.3	8.4	8.4	8.6	8.7	8.8	8.9	25.5
	<i>Seed 3</i>	8.7	8.9	8.9	8.9	9.1	9.2	9.3	9.3	9.4	9.5	9.6	9.7	9.8	9.0	10.5
	<i>Seed 4</i>	9.1	9.3	9.6	9.7	9.8	9.8	9.8	9.9	10.1	10.5	10.5	10.6	10.7	10.8	11.2
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 2B: EFFECT OF MALE <15 HAIR ON THE LENGTH OF THE LEAVES

Weight of Hair	Seeds	Length of the Leaves (L1, L2, L3,...) (in cm)												
		Day 1	Day 3	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 12	Day 13	Day 14	Day 15	Day 16
10 g	Seed 1	0	0	3.1 2.7	4.5 3.8	5.1 4.5	5.8 5.2	6.3 6.1	6.3 6.2 1.7 1.6 2	6.3 6.7 3.2 3.1 3.2	6.6 6.8 3.3 3.3 3.5	6.8 6.9 3.4 3.6 3.6	6.9 6.9 4 4.1 3.8	6.9 6.9 4.4 4.2 3.9
	Seed 2	0	0	2.3 2.1	3.2 3.3	4 4.3	4.1 4.7	4.9 5.4	6.1 5.6 2.6 1.6 2.1	6.2 5.8 2.7 2.8 3.7	6.3 5.8 2.8 3.1 3.9	6.4 5.9 2.9 3.3 4	6.9 5.9 3.9 3.5 4.1	6.9 5.9 3.9 3.5 4.1
	Seed 3	0	0	1.4 1.5	2.1 2.2	3.2 3.3	4.3 3.8	4.4 4.6	4.7 5.7 1 1	4.9 5.8 2 3.1	4.9 5.9 2.1 3.2	4.9 5.9 2.7 3.8	5 6.1 2.8 3.9	5 6 2.8 3.9
	Seed 4	0	0	Sprouted	2.3 1.5	4 2.8	4.7 3.5	5.2 3.8	5.7 4	6 4.1	6.1 4.2	6.1 4.3	6.2 4.5	6.4 4.7
	Seed 5	0	0	0	0	0	0	0	0	0	0	0	0	0
25 g	Seed 1	0	0	Leaf sprouted out	Small Leaf arises	0.5 0.6	0.6 1.2 1.8	2.6 2 1.6	2.6 2.6 3.1 0.9	3 3.2 4 1.2	3.6 3.3 4.6 2.1	3.9 3.4 4.6 2.2	3.9 3.5 4.7 2.4	3.9 3.6 4.9 2.4 1.9
	Seed 2	0	0	1.5 1.4	2.3 2	3. 3.4	3.6 3.8	4.6 4.1	5.1 4.6 1.3 2 1.7	5.1 4.8 2.9 2.2 2.1	5.2 5 4.6 2.3 2.3	5.2 5.1 4.6 2.5 2.5	5.3 5.1 4.7 2.6 2.8	5.3 5.5 4.9 2.7 2.9
	Seed 3	0	0	1.4 1.6	2.1 2.0	2.5 2.3	2.7 2.6	3.1 2.8	3.2 2.8	3.6 3.1	3.7 3.2	3.8 3.3	4.7 5.2	4.9 5.7
	Seed 4	0	0	1.3	1.5	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.5	2.6

				1.5	1.7	1.9	2.1	2.3	2.6	2.6	3	3.1	3.2	3.4
	<i>Seed 5</i>	0	0	0	0	0	0	1.1 1.2	1.1 1.9	2 2.7	2.6 2.8	2.7 2.9	2.8 2.9	3.1 3.3
40 g	<i>Seed 1</i>	0	0	2 2.1	4.1 3.1	4 4.9	4.6 5.2	4.7 5.8	5 5.8 1.8 0.9 1.6	5.1 5.9 2.1 2.4 2.6	5.8 6.1 2.3 2.6 2.7	6.1 6.3 2.5 2.9 3.1	6.2 6.5 2.6 2.9 3.2	6.3 6.7 2.8 3.3 3.7
	<i>Seed 2</i>	0	0	2.2 2.4	3.8 3.9	4.5 3.8	5.5 4.8	5.6 6	6.1 5.2 1 1.1 1.1	6.1 6.1 2.6 2.7 3	5.5 6.7 2.7 2.7 3.2	6.3 6.7 3 3.1 3.2	6.5 6.9 3.2 3.3 3.4	6.5 6.9 3.3 3.5 3.4
	<i>Seed 3</i>	0	0	2 1.6	2.5 3.1	4.5 3.8	5.5 4.8	5.6 6	6.1 6.2 1 1.1 1.1	6.5 6.6 1.2 1.3 1.5	6.5 6.7 2.1 1.9 2.2	5.6 6.8 2.2 1.9 2.5	5.7 6.9 2.3 2.2 2.7	5.9 7 2.5 2.8 2.7
	<i>Seed 4</i>	0	0	1 2	3.1 3.2	4.5 4.5	5.3 5.3	5.6 5.6	6.5 6.1 0.7 1.1 1.4	6.5 6.2 1.2 1.3 1.7	6.6 6.3 2.4 1.8 1.9	6.6 6.6 2.6 2.3 2.2	6.7 6.8 2.8 2.5 2.4	6.8 6.9 2.9 2.9 2.7
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0

Weight of Hair	Seeds	Length of the Leaves (L1, L2, L3,...) (in cm)														
		Day23	Day26	Day27	Day28	Day29	Day30	Day33	Day 34	Day 35	Day 38	Day 39	Day 40	Day 41	Day 42	Day 47
10 g	Seed 1	7.1	7.3	7.6	7.7	7.8	7.8	7.9	8.1	8.2	8.3	8.5	8.6	8.7	8.8	9.2
		7.1	7.3	7.5	7.6	7.7	7.8	7.8	7.9	8.1	8.2	8.5	8.6	8.7	8.8	8.9
		8.1	8.3	8.5	8.6	8.7	8.8	8.8	8.9	9.1	9.2	9.5	9.6	9.7	9.8	10.2
		4.7	4.9	5.3	5.4	5.5	5.5	5.6	5.7	5.8	5.8	5.9	5.9	5.9	6.1	7.3
		4.3	4.5	4.7	4.7	5	5.2	5.3	5.4	5.5	5.7	6	6.1	6.5	6.6	6.9
	Seed 2	11.2	11.2	11.3	11.4	11.5	11.5	11.6	11.7	11.8	11.9	12.1	12.2	12.3	12.4	13.5
		10.3	10.3	10.5	10.6	10.7	10.8	10.8	10.9	11.1	11.3	11.5	11.6	11.7	11.8	12.1
		4.3	4.3	4.5	4.7	4.8	4.8	4.9	5.1	5.2	5.4	5.6	5.7	5.8	5.9	6.6
		4.6	4.6	4.6	4.7	4.8	4.8	4.9	5.3	5.4	5.5	5.8	5.9	5.9	6.1	6.5
		4.3	4.3	4.8	4.9	5	5.1	5.2	5.5	5.5	5.7	5.9	6.1	6.2	6.4	6.7
	Seed 3	5.1	5.3	5.6	5.7	5.8	5.8	5.9	5.9	6.1	6.3	6.5	6.6	6.7	6.8	7.6
		6.1	6.3	6.4	6.5	6.6	6.6	6.7	6.8	6.9	6.9	6.9	6.9	7.1	7.2	8.1
		7.1	7.3	7.5	7.6	7.7	7.8	7.8	7.9	8.1	8.4	8.5	8.6	8.7	8.8	9.5
		5.7	5.8	5.9	5.9	5.9	5.9	5.9	5.9	6.1	6.3	6.5	6.6	6.7	6.8	6.8
		7.1	7.2	7.4	7.6	7.6	7.6	7.6	7.7	7.8	7.8	7.9	7.9	7.9	7.9	7.9
	Seed 4	5.1	5.2	5.5	5.5	5.7	5.8	5.8	5.9	5.9	6	6.1	6.2	6.3	6.4	7.1
		0.1	0.5	0.5	0.9	0.9	0.9	0.9	0.9	1.1	1.2	1.5	1.6	1.7	1.8	2.2
		0.7	2.9	2.9	2.9	3.1	3.1	3.1	3.2	3.3	3.5	3.6	3.7	3.8	3.9	4.5
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25 g	Seed 1	5.7	5.8	5.9	5.9	5.9	5.8	5.9	5.9	6.1	6.3	6.5	6.6	6.6	6.8	7.2
		5.8	5.9	5.9	5.9	5.9	6.1	6.1	6.2	6.3	6.5	6.8	6.9	7.1	7.2	7.5
		0.7	0.9	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.8	1.9	2.1	2.3	2.3	3.1
		2.6	3.3	3.5	3.6	3.7	3.7	3.8	3.9	3.9	4	4.1	4.2	4.3	4.4	5.2
		2.5	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	3.1	3.2	3.3	3.4	3.5	3.8
	Seed 2	7.1	7.2	7.3	7.4	7.5	7.6	7.6	7.7	7.8	7.8	8.5	8.6	8.7	8.8	No leaves
		8.1	8.2	8.3	8.4	8.5	8.5	8.6	8.7	8.8	8.9	9.1	9.2	9.3	9.4	
		5.7	5.7	5.8	6.9	6.9	6.9	6.9	6.9	6.9	7.3	7.5	7.6	7.7	7.8	
		3.1	3.8	3.9	3.9	4.1	4.1	4.1	4.2	4.4	4.8	4.8	4.9	4.9	5.0	
		3.1	3.9	3.9	6.9	6.9	6.9	6.9	6.9	6.9	7.1	7.1	7.5	7.6	7.8	
	Seed 3	7.1	7.3	7.4	7.5	7.6	7.6	7.7	7.8	7.9	7.9	8.1	8.2	8.3	8.4	No leaves
		8.1	8.3	8.5	8.6	8.7	8.8	8.8	8.9	9.1	9.1	9.5	9.6	9.7	9.8	
		8.1	8.3	8.5	8.6	8.7	8.8	8.8	8.9	9.1	9.1	9.5	9.6	9.7	9.8	
		8.1	8.3	8.5	8.6	8.7	8.8	8.8	8.9	9.1	9.1	9.5	9.6	9.7	9.8	
		8.1	8.3	8.5	8.6	8.7	8.8	8.8	8.9	9.1	9.1	9.5	9.6	9.7	9.8	

		0.2 1.7 2.1	0.4 1.9 2.3	0.6 1.9 2.5	0.7 4.9 2.5	0.8 1.9 2.7	1.9 2.7	0.9 1.9 2.9	0.9 1.9 2.9	0.9 2.1 2.9	2.3 3	2.5 2.5 3.2	2.6 2.6 3.3	2.6 2.7 3.4	2.7 2.8 3.5		
	<i>Seed 4</i>	8.1 9.1 0.5 1.7 2.9	8.3 9.3 0.9 1.9 2.1	8.5 9.5 0.9 1.9 2.3	8.6 9.6 0.9 4.9 2.4	8.7 9.7 0.9 4.9 2.5	8.7 9.8 0.9 4.9 2.6	8.8 9.8 0.9 4.9 2.6	FELL	FELL	FELL	FELL	FELL	FELL	FELL	FELL	FELL
	<i>Seed 5</i>	10.1 9.2 0.1 0.5 6.1	10.3 9.4 0.3 0.9 6.5	10.5 9.7 0.5 0.9 6.7	10.6 9.8 0.5 0.9 6.8	10.7 9.8 0.6 0.9 6.9	10.7 9.8 0.7 0.9 6.9	10.8 9.8 0.7 1.4 7.4	FELL	FELL	FELL	FELL	FELL	FELL	FELL	FELL	FELL
40 g	<i>Seed 1</i>	7.1 7.1 3.9 8.1 9.9	7.4 7.4 3.3 1.3 2.1	7.3 7.3 3.9 8.9 9.9	7.4 7.4 6.9 8.9 9.9	7.5 7.5 6.9 8.9 9.9	7.6 7.6 6.9 8.9 9.9	7.6 7.6 7 8.9 9.9	7.7 7.7 7.1 7.3 9.9	7.8 7.8 7.2 7.4 9.9	7.9 7.9 7.4 7.5 9.9	8.2 7.9 7.6 7.5 9.9	8.3 7.9 7.1 7.6 10.1	8.4 7.9 7.8 7.7 10.5	8.5 8.1 7.9 7.8 10.3	8.5 FELL8.1 8.6 FELL	
	<i>Seed 2</i>	7.1 8.1 4.2 4.1 4.2	7.3 8.2 4.3 4.2 4.3	7.8 8.7 4.5 4.5 4.7	7.9 8.8 4.6 4.6 4.8	7.9 8.9 4.7 4.1 4.9	7.9 8.9 4.8 4.4 4.9	8.1 8.9 4.8 4.8 4.9	8.2 8.9 4.9 4.9 4.9	8.3 8.9 5.2 5.2 5.1	8.5 9.1 5.4 5.4 5.1	8.8 9.2 6.5 5.5 5.2	8.8 9.2 6.6 5.6 5.3	8.9 9.3 6.7 5.7 5.4	10.1 9.5 6.8 5.8 5.5	10.9 9.9 7.2 6.3 5.8	
	<i>Seed 3</i>	5.1 5.2 5.5 6.6 1.1	6.8 6.9 9.9 10.5 2.6	6.9 6.9 9.9 11.5 5.6	7.1 7.1 10.1 11.6 5.7	7.2 7.2 10.2 11.7 5.8	7.2 7.2 10.2 11.7 5.8	7.3 7.4 10.3 11.8 5.8	7.3 7.4 10.4 11.9 5.9	7.4 7.5 10.5 11.9 6.1	7.5 7.6 10.6 11.9 6.2	7.6 7.7 10.6 11.9 6.2	7.6 7.7 10.6 11.9 6.2	7.7 7.8 10.7 12.1 6.3	7.8 7.9 10.8 12.2 6.5	7.9 8.1 10.9 12.3 6.6	8.2 8.5 11.2 12.5 6.8
	<i>Seed 4</i>	6.7 7.8 9.9 10.1 3.5	6.8 7.9 10.1 10.2 3.6	6.9 10.1 10.2 10.3 3.7	7.1 10.2 10.3 10.4 3.8	7.2 10.3 10.4 10.5 3.9	7.3 10.4 10.5 10.6 4	7.3 10.4 10.5 10.6 4.1	7.3 10.4 10.5 10.6 4.2	7.4 10.5 10.6 10.7 4.3	7.5 10.6 10.7 10.8 4.4	7.5 10.6 10.8 10.8 4.4	7.6 10.7 10.8 10.9 4.4	7.7 11.2 11.2 11.7 5.3	7.8 11.3 11.3 11.8 5.4	8.3 11.6 11.8 11.9 5.5	8.8 11.8 12.1 12.3 5.9
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 3: EFFECT OF MALE >15 HAIR ON THE GROWTH OF *LABLAB PURPUREUS*

TABLE 3A: EFFECT OF MALE >15 HAIR ON THE LENGTH OF THE PLANT

Weight of Hair	Seeds	Length of the plant (in cm)												
		Day 1	Day 3	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 12	Day 13	Day 14	Day 15	Day 16
10 g	Seed 1	0	0	6.4	9.6	13	16.6	18.6	18.7	20.2	20.3	20.5	20.6	20.9
	Seed 2	0	0	7	9.1	10.5	11.1	11.1	11.1	12.2	12.5	12.8	12.9	13.2
	Seed 3	0	0	8.8	15	18.5	20.5	20.6	20.6	22.7	22.9	22.9	22.9	23
	Seed 4	0	0	5.5	8.1	11.7	13.7	13.7	13.9	15.1	15.2	15.3	15.4	15.6
	Seed 5	0	0	8.4	13.4	17.1	19	20.6	20.6	21.1	21.2	21.5	21.9	21.9
25 g	Seed 1	0	0	10.8	15.7	18	18.9	21	21.7	22.7	22.7	22.8	22.9	23
	Seed 2	0	0	6.1	10.3	14.5	15.9	17.1	17.4	18.8	18.9	18.9	18.9	19.3
	Seed 3	0	0	7.5	11.3	17	19.3	21	21.2	22.6	22.7	22.8	22.9	22.9
	Seed 4	0	0	5	11.8	17.1	19.1	20	20.1	21.1	21.9	21.9	21.9	22
	Seed 5	0	0	6	11.5	17.5	20.2	22.1	25.1	25.1	25.2	25.4	25.5	25.7
40 g	Seed 1	0	0	9.5	14.8	18.9	21.1	21.6	21.7	22.7	23.8	23.9	23.9	24
	Seed 2	0	0	7.1	13.6	16.8	19.2	20.1	21.1	23.1	23.2	23.4	23.5	23.7
	Seed 3	0	0	4.1	5.8	8.1	10	11	11.9	12.8	13.9	13.9	23.4	23.5
	Seed 4	0	0	0	0	0	0	0	0	0	0	0	0	0
	Seed 5	0	0	0	0	0	0	0	0	0	0	0	0	0

<i>Weight of Hair</i>	<i>Seeds</i>	<i>Length of the plant (in cm)</i>															
		<i>Day23</i>	<i>Day 26</i>	<i>Day 27</i>	<i>Day 28</i>	<i>Day 29</i>	<i>Day30</i>	<i>Day 33</i>	<i>Day 34</i>	<i>Day 35</i>	<i>Day38</i>	<i>Day 39</i>	<i>Day 40</i>	<i>Day 41</i>	<i>Day 42</i>	<i>Day 47</i>	
10 g	<i>Seed 1</i>	20.1	20.3	20.5	20.6	20.7	20.8	20.9	21.1	21.2	22.5	22.6	22.7	22.8	22.9	23.2	
	<i>Seed 2</i>	22.3	22.5	22.7	22.8	22.9	23	23.2	23.2	23.3	23.5	23.9	24.1	24.2	24.3	24.7	
	<i>Seed 3</i>	23.8	24	24.1	24.4	24.5	24.8	25	25.2	25.3	25.9	26.1	26.5	26.5	26.7	26.9	
	<i>Seed 4</i>	16.1	16.5	16.5	16.6	16.7	6.8	16.8	16.9	17.1	17.3	17.5	17.6	17.7	17.8	17.9	
	<i>Seed 5</i>	20.3	20.6	20.7	20.8	20.9	21	21.1	21.2	21.3	21.5	21.8	21.9	22.1	22.2	22.6	
25 g	<i>Seed 1</i>	23.7	23.4	23.5	23.7	23.8	23.9	24.5	24.9	24.9	25.7	25.9	26.1	26.2	26.3	26.6	
	<i>Seed 2</i>	21.1	21.5	21.6	21.9	21.9	22	22.1	22.4	22.5	23	23.2	23.3	23.4	23.5	23.6	
	<i>Seed 3</i>	23.9	23.9	23.9	30.8	30.9	31	31.1	31.2	31.3	32.4	32.6	32.7	32.8	32.9	33.3	
	<i>Seed 4</i>	22.3	22.6	22.7	27.7	27.8	27.8	27.9	27.9	27.9	27.9	27.9	27.9	28.1	28.2	28.3	28.9
	<i>Seed 5</i>	27.1	27.5	27.6	27.7	27.8	27.9	27.9	27.9	27.9	27.9	28	28.2	28.3	28.4	28.5	28.9
40 g	<i>Seed 1</i>	25.9	25.9	25.9	26	26.5	26.8	27.1	27.2	27.3	27.7	27.8	27.9	28.1	28.2	28.6	
	<i>Seed 2</i>	24.3	24.7	24.8	24.9	24.9	25.4	26.1	26.2	26.3	26.6	27.7	27.8	27.9	27.9	27.9	
	<i>Seed 3</i>	24.2	24.5	24.6	24.7	24.8	24.9	25	25.1	25.1	25.4	25.5	25.6	25.7	25.8	25.9	
	<i>Seed 4</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

TABLE 3B: EFFECT OF MALE >15 HAIR ON THE LENGTH OF THE LEAVES

<i>Weight of Hair</i>	<i>Seeds</i>	<i>Length of the Leaves (L1, L2, L3,...)(in cm)</i>											
		<i>Day 1</i>	<i>Day 3</i>	<i>Day 5</i>	<i>Day 6</i>	<i>Day 7</i>	<i>Day 8</i>	<i>Day 9</i>	<i>Day 10</i>	<i>Day 12</i>	<i>Day 13</i>	<i>Day 14</i>	<i>Day 15</i>
<i>10 g</i>	<i>Seed 1</i>	0	0	2	2.2	3.4	4.5	5	5.3	5.6	5.6	5.7	5.8
				2.1	2.1	3.2	4.2	4.3	4.4	5.1	5.4	5.5	5.6
	<i>Seed 2</i>	0	0	1.9	2.1	2.8	3	3.1	3.3	3.6	3.8	3.9	3.9
				1.6	2.4	2.2	2.4	2.7	2.7	2.7	2.8	2.9	2.9
	<i>Seed 3</i>	0	0	2.3	3.6	5	5.1	5.2	5.8	6.1	6.3	6.4	6.6
			2.4	3.9	4.9	5.4	6.1	6.1	6.1	6.1	6.2	6.4	
<i>Seed 4</i>	0	0	1.4	2.3	4	4.5	4.8	4.9	5.1	5.2	5.9	5.9	
			1.6	3	3	4.4	4.6	4.9	5.1	5.1	6.2	6.3	
<i>Seed 5</i>	0	0	2.5	3.4	4.2	4.7	5	5.7	5.8	5.9	5.9	5.9	
			2.1	3.1	4.6	5.2	5.3	5.3	5.6	6.1	6.3	6.4	
<i>25 g</i>	<i>Seed 1</i>	0	0	2.5	3.1	4.1	4.6	5.1	5.2	5.7	5.8	5.9	5.9
				2.6	3.8	4.8	5.5	5.8	5.8	6	6.1	6.2	6.2
	<i>Seed 2</i>	0	0	2.1	3.1	4.4	4.9	5.3	5.7	5.8	5.9	5.9	5.9
				1.9	3.3	4.1	4.6	4.7	5.6	5.7	5.8	5.9	5.9
	<i>Seed 3</i>	0	0	2.1	3.2	4.5	5.2	5.6	6	6.1	6.7	6.8	6.9
				2.2	3.0	4.1	5.1	5.2	5.3	5.7	5.8	5.9	5.9

	<i>Seed 4</i>	0	0	2.3 2.1	2.5 2.6	4 4.1	4.5 4.9	4.6 5	4.9 5.3	4.9 5.6	5.3 5.7	6.8 6.9	6.9 6.9
	<i>Seed 5</i>	0	0	2.1 2.0	2.6 2.9	4.1 4.5	4.6 5.4	4.9 5.9	4.9 5.9	4.9 6.2	5.3 6.1	5.5 6.2	5.6 6.4
40 g	<i>Seed 1</i>	0	0	2.3 2.2	3.5 3.1	4.8 4.5	4.8 5.2	5.4 5.6	5.7 5.6	6. 5.6	6.6 6	6.9 6.2	6.9 6.4
	<i>Seed 2</i>	0	0	1.9 2	3.2 3.3	4.3 4.8	4.3 4.8	4.6 5.4	4.6 5.3	4.6 6	5.1 6.1	5.2 6.2	5.3 6.3
	<i>Seed 3</i>	0	0	1.7 1.5	1.8 1.6	1.8 1.6	2.2 1.8	2.4 2	2.4 2.6	2.4 2.7	2.5 3	2.7 3.1	2.8 3.2
	<i>Seed 4</i>	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0

<i>Weight Of Hair</i>	<i>Seeds</i>	<i>Length of the Leaves (L1, L2, L3,...) (in cm)</i>																
		<i>Day16</i>	<i>Day23</i>	<i>Day26</i>	<i>Day27</i>	<i>Day28</i>	<i>Day29</i>	<i>Day30</i>	<i>Day33</i>	<i>Day34</i>	<i>Day35</i>	<i>Day 38</i>	<i>Day 39</i>	<i>Day 40</i>	<i>Day 41</i>	<i>Day 42</i>	<i>Day 47</i>	
10 g	Seed 1	5.9	5.1	5.3	5.4	5.5	5.6	5.7	5.7	5.8	5.9	6.3	6.5	6.6	6.7	6.8	7.1	
		5.7	6.1	6.4	6.6	6.7	6.8	6.8	6.9	6.9	6.9	6.9	6.9	7.1	7.2	7.3	7.6	
			2.6	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	3.1	3.4	3.6	3.7	3.8	3.9	3.9
			2.1	2.5	2.6	2.7	2.8	2.9	2.9	2.9	2.9	3.2	3.5	3.8	3.9	4.1	4.2	4.6
	Seed 2	3.9	3.1	3.6	3.7	3.8	3.9	4	4.1	4.2	4.3	4.3	4.5	4.6	4.7	4.8	4.9	
		3.1	3.7	3.9	3.9	3.9	3.9	4	4.1	4.1	4.2	4.6	4.9	5.1	5.2	5.3	5.2	
	Seed 3	6.7	7.1	7.2	7.3	7.4	7.5	7.6	7.6	7.7	7.8	7.9	8	8.1	8.2	8.3	FELL	
		6.7	7.1	7.6	7.7	7.8	7.9	8	8.2	8.2	8.3	8.6	8.8	8.9	9.1	9.2		
			6.2	6.5	6.6	6.7	6.8	6.8	6.9	6.9	6.9	6.9	6.9	6.9	7.1	7.2		7.3
			5.1	5.3	5.5	5.6	5.7	5.8	5.8	5.9	5.9	6	6.2	6.3	6.4	6.5		
	Seed 4	5.9	6.1	6.5	6.7	6.8	6.9	7	7.1	7.2	7.3	7.6	7.8	7.9	7.9	7.1	FELL	
		6.4	6.5	6.8	6.9	6.9	6.9	6.9	7.1	7.2	7.3	7.5	7.8	7.9	8.1	8.2		8.6
			7.2	7.5	7.8	7.8	7.9	8.1	8.1	8.5	8.6	8.7	8.8	8.9	9.3	9.4		9.6
			6.1	6.8	7.7	7.9	7.9	7.5	7.5	7.6	7.7	7.7	7.9	8.1	8.2	8.3		8.9
			7.2	7.5	7.6	7.8	7.9	7.9	7.9	7.9	7.9	7.9	8	8.2	8.3	8.4		8.5

	Seed 5	5.9 6.7 2.1	6.1 7.1 8.1	6.8 7.9 8.5 0.3 2.6	6.9 7.9 8.7 0.3 2.7	6.9 7.9 8.8 0.4 2.7	6.9 7.9 8.8 0.5 2.8	6.9 8 8.9 0.5 2.8	7.1 8.1 8.9 0.6 2.9	7.2 8.2 8.9 0.7 2.9	7.3 8.3 8.9 0.8 2.9	7.5 8.4 8.9 0.9 3.1	7.8 8.5 8.9 0.9 3.2	7.9 8.6 8.9 1.2 3.3	8.1 8.7 8.9 1.3 3.4	8.2 8.8 9 1.4 3.5	FELL 8.9 9.1 1.5 3.6
25 g	Seed 1	5.9 6.6	6.1 7.1 2.1 0.3 0.7	6.3 7.3 2.4 0.6 0.8	6.4 7.5 2.5 0.7 0.9	6.5 7.6 2.7 0.9 0.9	6.5 7.7 2.9 1.1 1	6.6 7.9 3 1.4 1.2	6.7 8 3.2 1.6 1.4	6.8 8.1 3.4 1.8 1.5	6.9 8.3 3.5 1.9 1.6	6.9 8.5 3.6 1.9 1.8	7.2 8.7 3.7 2.1 1.9	7.3 8.9 3.9 2.3 2.1	7.4 9.1 4 2.5 2.1	7.5 9.4 4.3 2.6 2.2	FELL (damage d by insects)
	Seed 2	6 6.1	6.1 7.1 8.1	6.8 7.9 8.5 2.2	6.9 7.9 8.7 2.5 2.7	6.9 7.9 8.8 2.7 2.8	6.9 8 8.8 2.8 2.8	6.9 8 8.9 2.8 2.8	7.1 8.1 8.9 2.9 2.9	7.2 8.2 8.9 2.9 2.9	7.3 8.3 8.9 2.9 2.9	7.5 8.4 8.9 3.1 3.2	7.8 8.5 8.9 3.2 3.3	7.9 8.6 8.9 3.3 3.4	8.1 8.7 8.9 3.4 3.5	8.2 8.8 9.2 3.5	FELL (damag ed by insects)
	Seed 3	7 6.2	7.7 9.3 4.3 3.2 3.1	7.8 9.5 4.5 3.3 3.5	7.9 9.6 4.7 3.4 3.6	8.2 9.8 4.8 3.7 3.8 0.3 0.5	8.5 9.8 4.8 3.7 3.8 0.4 0.7	8.6 9.9 4.9 3.8 3.9 0.7 0.9	8.8 10.1 5.2 3.9 4.1 0.9 1.1	8.9 10.3 5.3 4 4.2 0.9 1.3	8.9 10.6 5.5 4.6 4.5 1.2 1.6	9.2 10.8 5.7 4.8 4.6 1.5 1.7	9.4 10.9 5.9 5.1 4.9 1.8 1.9 0.6	10.2 11.4 6.2 5.4 1.9 2.3 1.9 0.8	10.3 11.7 6.4 5.7 2.2 2.3 2.3 1.1	10.4 11.9 6.9 5.8 2.5 2.5 2.1 1.8	11.3 12.9 7.8 6.9 4.5 3.9 2.9 2.7

	Seed 4	7.1 7.3	7.1 8.1 5.7 3.5 2.8	7.2 8.2 5.7 3.8 3.9	7.3 8.3 5.8 3.9 3.9	7.4 8.4 6.9 3.9 4.9	7.5 8.5 6.9 4.1 4.9	7.6 8.5 6.9 4.1 5.1	7.6 8.6 6.9 4.1 5.4	7.7 8.7 6.9 4.2 5.9	7.8 8.8 6.9 4.4 6.1	7.8 8.9 7.3 4.8 6.1	8.5 9.1 7.5 4.8 6.5	8.6 9.2 7.6 4.9 6.6	8.7 9.3 7.7 4.9 6.6	8.8 9.4 7.8 5.0 6.8	9.1 10.1 8.7 5.1 7.1	
	Seed 5	5.7 6.6	7.1 7.1 0.1 0.7	7.2 7.2 0.5 2.9	7.4 7.5 0.5 2.9	7.6 7.5 0.9 2.9	7.6 7.7 0.9 3.1	7.6 7.8 0.9 3.1	7.6 7.8 0.9 3.1	7.7 7.9 1 3.2	7.8 7.9 1.1 3.3	7.8 8 1.2 3.5	7.9 8.1 1.5 3.6	7.9 8.2 1.6 3.7	7.9 8.3 1.7 3.8	7.9 8.4 1.8 3.9	8.1 8.5 2.5 4.3	
40 g	Seed 1	6.9 6.7	7.1 7.5 0.1 0.5 2.1	7.2 7.8 0.9 0.6 2.4	7.4 7.9 0.9 0.8 2.6	7.5 7.9 0.9 0.9 2.8	7.6 8.1 0.9 2.3 2.9	7.6 8.5 1.1 2.9 3	7.7 8.6 1.2 1.1 3.1	7.8 8.9 1.2 1.3 3.2	7.9 9.1 1.3 1.4 3.3	7.9 9.1 1.4 1.4 3.3	7.9 9.6 1.4 1.6 3.4	8.1 9.7 1.5 1.7 3.5	8.2 9.8 1.6 1.8 3.6	8.3 9.9 1.7 1.8 3.7	8.7 10.8 1.9 3.8 4.4	
	Seed 2	5.5 6.6	5.2 5.5 0.3 0.3 5.1	5.4 5.6 0.4 0.5 5.9	5.6 5.8 0.6 0.7 5.9	5.7 5.9 0.9 0.8 5.9	5.7 5.9 2.5 0.9 5.9	5.8 5.9 3.7 1.9 5.9	5.9 6.1 6.7 2.7 5.9	5.9 6.2 6.8 2.8 5.9	6.1 6.3 6.9 2.9 5.9	6.1 6.3 6.9 3.3 5.9	6.2 6.8 6.9 3.8 5.9	6.2 6.9 7.1 3.9 6.1	6.3 6.9 7.2 3.9 6.3	6.4 6.9 7.2 3.9 6.2	6.5 6.9 7.6 4.4 6.4	
	Seed 3	2.9 3.4	3.1 3.6 0 0	3.3 3.8 0 0	3.5 3.9 0 0	3.6 3.9 0 0	3.7 3.9 0 0	3.7 3.9 0 0	3.8 4.1 0 0	3.9 4.2 0 0	4.1 4.2 0 0	4.2 4.3 0 0	4.5 4.8 0 0	4.6 4.9 0 0	4.7 5.1 0 0	4.8 5.2 0 0	5.9 5.5 0 0	
	Seed 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Seed 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 4: EFFECT OF FEMALE <15 HAIR ON THE GROWTH OF *LABLAB PURPUREUS*

TABLE 4A: EFFECT OF FEMALE <15HAIR ON THE LENGTH OF THE PLANT

Weight of Hair	Seeds	Length of the plant (in cm)												
		Day 1	Day 3	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 12	Day 13	Day 14	Day 15	Day 16
10 g	Seed 1	0	0	8.4	13.1	17	17.7	19	19.3	20.4	20.5	20.7	18.5	18.6
	Seed 2	0	0	SP	5.2	11.7	14.2	16.9	16.9	18.2	18.3	18.5	16.2	16.4
	Seed 3	0	0	SP	3.1	7.5	10.4	11.6	11.8	12.7	12.8	12.9	12.9	13
	Seed 4	0	0	0	0	0	0	0	0	0	0	0	0	0
	Seed 5	0	0	0	0	0	0	0	0	0	0	0	0	0
25 g	Seed 1	0	0	7.6	13.6	18.6	20.6	23.8	23.8	23.9	24.1	24.3	24.9	25
	Seed 2	0	0	7.4	10.7	13.7	16.5	18	21.2	21.2	Damaged	Damaged	Damaged	0
	Seed 3	0	0	5.5	7.6	12.5	16.5	17.6	20.3	20.6	21.7	21.8	21.8	21.9
	Seed 4	0	0	5.5	10.2	16	19.6	21	21.1	21.6	22.8	22.9	22.9	23.1
	Seed 5	0	0	6.2	12.0	16.5	18.9	20	20.1	22.5	22.9	22.9	22.9	23.7
40 g	Seed 1	0	0	11.3	16.1	20.1	20.9	22	22.1	23.1	23.2	23.6	23.7	20.7
	Seed 2	0	0	6.5	11.2	15.2	18.6	19.3	20	20.2	20.3	20.4	20.6	20.9
	Seed 3	0	0	0	0	0	0	0	0	0	0	0	0	0
	Seed 4	0	0	S.P	S.P	1.7	4.5	11.3	12.6	20.5	23.6	23.8	26	26.2
	Seed 5	0	0	0	0	0	0	0	0	0	0	0	0	0

<i>Weight of Hair</i>	<i>Seeds</i>	<i>Length of the plant (in cm)</i>														
		<i>Day 23</i>	<i>Day 26</i>	<i>Day 27</i>	<i>Day 28</i>	<i>Day 29</i>	<i>Day 30</i>	<i>Day 33</i>	<i>Day 34</i>	<i>Day 35</i>	<i>Day 38</i>	<i>Day 39</i>	<i>Day 40</i>	<i>Day 41</i>	<i>Day 42</i>	<i>Day 47</i>
<i>10 g</i>	<i>Seed 1</i>	5.1	5.3	5.5	5.6	5.7	5.7	5.9	5.9	6.1	6.5	6.6	6.7	6.8	6.9	20.6
	<i>Seed 2</i>	6.2	6.4	6.5	6.7	6.8	6.8	6.9	6.9	7.1	7.4	7.6	7.7	7.8	7.9	0
	<i>Seed 3</i>	13.3	13.5	13.8	13.9	13.9	14	14.1	14.2	14.3	14.5	14.8	14.9	14.9	15.1	0
	<i>Seed 4</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>25 g</i>	<i>Seed 1</i>	26	26.1	26.5	26.6	26.7	27	27.8	27.9	27.1	WR	0	0	0	0	0
	<i>Seed 2</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Seed 3</i>	23	23.1	23.6	23.7	23.8	23.9	23.9	23.9	24.1	24.4	24.6	W.R	W.R	W.R	W.R
	<i>Seed 4</i>	WR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Seed 5</i>	24.6	24.8	24.9	24.9	24.9	25.3	25.5	26.1	26.3	26.3	26.5	26.6	26.7	26.8	26.9
<i>40 g</i>	<i>Seed 1</i>	23	23.1	23.2	23.5	23.6	23.7	23.7	23.8	23.9	23.9	24	24.1	24.1	24.2	24.5
	<i>Seed 2</i>	21.8	21.9	21.9	22	22.2	23	23.3	23.4	23.9	24.2	0	0	0	0	0
	<i>Seed 3</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Seed 4</i>	27.1	27.7	27.8	27.8	27.8	27.9	27.9	27.9	28.1	28.5	28.6	28.7	28.8	28.9	32
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 4B: EFFECT OF FEMALE <15HAIR ON THE LENGTH OF THE LEAF

Weight of Hair	Seeds	Length of the Leaves (L1, L2, L3,...) (in cm)											
		Day 1	Day 3	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 12	Day 13	Day 14	Day 15
10 g	Seed 1	0	0	2.1	3	3.5	4.7	4.1	4.5	4.7	5	5.4	5.4
				2.1	FELL	0	0	0	0	0	0	0	0
	Seed 2	0	0	0	1.8	3.5	4.2	4.8	5.6	5.6	5.2	5.9	5.9
				0	2.1	3.2	4.3	4.4	4.5	4.6	4.6	4.9	4.9
	Seed 3	0	0	0	0.5	1.2	2.0	2.4	2.4	2.5	2.6	2.8	2.9
			0	0.4	1.3	1.6	1.7	2.1	2.6	2.7	2.8	2.9	
Seed 4	0	0	0	0	0	0	0	0	0	0	0	0	
Seed 5	0	0	0	0	0	0	0	0	0	0	0	0	
25 g	Seed 1	0	0	2.6	3.2	5	5.1	5.2	5.7	6	6.1	6.2	6.7
				2.2	3.6	5.2	5.3	5.4	5.5	5.5	6.6	6.8	6.9
	Seed 2	0	0	2.1	2.2	2.3	2.5	4	4.6	5.2	DAMAGED	DAMAGED	DAMAGED
				2.4	2.5	2.6	2.7	4.1	4.6	5.1			
	Seed 3	0	0	1.6	1.7	2.8	3.2	3.2	4.1	4.2	4.7	4.8	4.9
			1.4	2.1	2.8	3.5	4.1	3.6	4.1	4.1	4.2	4.3	
Seed 4	0	0	2.5	2.5	3.4	3.9	4.6	5.2	5.3	5.1	5.2	5.3	
			2.4	2.4	3.5	4.2	4.4	4.5	4.6	4.7	4.8	4.8	
Seed 5	0	0	2.1	2.3	4.2	4.8	5.7	5.7	5.8	5.8	5.9	5.9	
			2.1	2.6	3.8	4.3	5.7	5.8	5.9	5.9	5.9	5.9	
40 g	Seed 1	0	0	2.6	3.3	4.5	4.7	5	5.1	5.1	5.7	5.8	6
				1.9	3.1	4.2	4.3	5.3	4.6	5.7	4.8	4.9	5.1
	Seed 2	0	0	0.5	1.4	2.8	4	4.1	4.6	4.7	4.3	4.9	4.9
				FELL	FELL	FELL	FELL	FELL	FELL	FELL	FELL	FELL	FELL
	Seed 3	0	0	0	0	0	0	0	0	0	0	0	0
Seed 4	0	0	0	0	0	0	0	0	0	0	0	0	
Seed 5	0	0	0	0	0	0	0	0	0	0	0	0	

<i>Weight of Hair</i>	<i>Seeds</i>	<i>Length of the Leaves (L1, L2, L3,...) (in cm)</i>																
		<i>Day16</i>	<i>Day 23</i>	<i>Day 26</i>	<i>Day 27</i>	<i>Day 28</i>	<i>Day 29</i>	<i>Day 30</i>	<i>Day 33</i>	<i>Day34</i>	<i>Day35</i>	<i>Day 38</i>	<i>Day39</i>	<i>Day40</i>	<i>Day 41</i>	<i>Day 42</i>	<i>Day 47</i>	
10 g	Seed 1	5.5	5.6	5.9	5.9	5.9	5.9	6	6.1	6.2	6.3	6.7	6.9	7.1	7.2	FELL	FELL	
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.9	0.9	0.9	1.1	1.2	1.3	5.1
			0.5	0.6	0.7	0.7	0.6	0.6	0.7	0.8	0.9	1.1	1.2	1.3	1.4	1.5	1.5	1.6
		1.1	1.2	1.	1.4	1.5	1.5	1.6	1.7	0.8	0.8	0.9	0.9	1.1	1.3	1.5	1.6	
		1.1	1.2	1.	1.4	1.5	1.5	1.6	1.7	0.8	0.8	0.9	0.9	1.1	1.3	1.5	1.6	
	Seed 2	5.9	5.6	5.7	5.7	5.8	5.8	5.9	5.9	5.9	5.9	6.1	6.2	6.4	7.1	7.2		
		4.9	6.2	6.2	6.7	6.8	6.9	7.1	7.2	7.3	7.4	7.5	7.5	7.6	7.7	7.8	FELL	
			0.4	0.8	0.9	0.9	0.9	1.1	1.2	1.3	1.4	1.5	1.5	1.6	1.7	1.8		
			0.3	0.5	6.7	6.8	6.9	7	7.1	7.2	7.3	7.4	7.4	7.5	7.6	7.7		
	1.5	1.6	1.8	1.9	1.9	2	2.1	2.2	2.3	2.4	2.4	2.5	2.6	2.7				
Seed 3	2.9	4.1	4.5	4.8	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	5.1	5.2	5.3	FELL	
	2.9	3.5	3.9	3.9	3.9	3.9	4	4.1	4.2	4.3	4.3	4.4	4.5	4.6	4.7			
Seed 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Seed 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
25 g	Seed 1	6.8	6.1	6.2	6.4	6.3	6.6	6.8	6.9	7.1	7.4	7.6	7.8	7.9	8.2	8.6	9.2	
		7	7.1	7.2	7.3	7.4	7.5	7.7	7.8	7.9	8.2	8.4	8.7	8.9	9.1	9.5	9.7	
			3.1	3.3	3.5	3.6	3.7	3.9	4.1	4.4	4.6	4.7	4.9	5.2	5.4	5.7	6.2	
			0.2	0.5	0.6	0.7	0.8	1.3	3.4	3.7	3.8	3.9	4.2	4.5	4.6	4.8	5.3	
			2.6	2.8	2.9	2.9	2.9	3.5	3.7	3.9	4.1	4.3	4.4	4.7	4.8	4.9	5.1	

		DAM AGE D	0 0 3.1 3.4 1.1 2.3 2.4 2.1 2.7 2.3	0 0 2.5 2.7 2.8 2.7 2.5 2.7 2.7 2.7	0 0 3.6 3.2 1.4 2.1 2.7 2.9 2.8 2.9	0 0 3.6 3.5 1.5 2.5 2.8 2.9 2.8 2.9	0 0 3.7 3.6 1.6 2.6 2.9 2.7 2.9 2.9	0 0 3.8 3.8 1.7 2.8 3 2.9 2.9 2.9	0 0 3.8 3.9 1.7 2.9 3.1 2.9 2.9 3.1	0 0 3.9 3.9 1.8 3.1 3.2 3.2 3.2 3.2	0 0 3.9 4.1 1.9 3.3 3.3 2.9 3.4 3.9	0 0 4.2 4.3 2.1 3.4 3.3 2.9 3.4 3.9	0 0 4.6 4.5 2.3 3.6 3.5 3.2 3.6 4.1	0 0 4.8 4.7 2.5 3.8 3.6 3.5 3.7 4.3	0 0 4.9 4.9 2.7 3.9 3.7 3.8 3.9 4.5	0 0 5.1 5.2 2.9 4.2 3.9 4.1 4.8 4.8	0 0 6.8 5.9 3.7 4.8 4.7 4.1 4 4.6	0 0 6.8 5.9 3.7 4.8 4.7 4.1 4 4.6
	<i>Seed 3</i>	4.9 4.4 3.1 3.5 4.2	5.6 FELL 3.6 3.5 4.2	5.8 0 3.6 3.5 4.2	5.9 0 3.8 3.6 4.3	5.9 0 3.9 3.7 4.4	5.9 0 3.9 3.8 4.5	5.9 0 3.9 3.8 4.5	6.1 0 4.1 4.2 4.6	6.2 0 4.2 4.3 4.7	6.7 0 FELL FELL FELL	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	
	<i>Seed 4</i>	5.1 5.2	FELL FELL	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	<i>Seed 5</i>	6.1 6.2 0.1 0.9 1.2	7.1 7.1 0.2 0.9 1.5	7.1 7.3 0.3 0.9 1.6	7.2 7.4 0.4 0.9 1.7	7.3 7.5 0.5 0.9 1.7	7.4 7.5 0.8 0.9 1.8	7.6 7.7 0.8 1.2 2.2	FELL FELL FELL FELL	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
<i>40 g</i>	<i>Seed 1</i>	6.1 5.1 2.6 3.0 2.2 1.0 2.1	5.1 5.2 2.8 3.1 2.3 1.2 2.9	5.2 5.3 2.9 3.2 2.5 2.9 1.9	5.3 5.4 2.9 3.3 2.6 2.9 2.1	5.4 5.5 2.9 3.4 2.7 2.9 2.1	5.5 5.6 2.9 3.4 2.7 2.9 2.2	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
	<i>Seed 2</i>	5.1 FELL 4.8	6.3 FELL 4.8	6.5 FELL 4.9	6.7 FELL 4.9	6.7 FELL 4.9	7.1 FELL 4.9	FELL 0 5.2	0 0 FELL	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0

			1.1 2.0 2.1	1.3 2.4 2.8	1.5 2.3 2.9	1.6 2.4 2.9	1.7 2.5 2.9	2.1 3.7 3.5	FELL FELL FELL								
<i>Seed 3</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Seed 4</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 5: EFFECT OF FEMALE >15 HAIR ON THE GROWTH OF *LABLAB PURPUREUS***TABLE 5A: EFFECT OF FEMALE >15HAIR ON THE LENGTH OF THE PLANT**

<i>Weight of Hair</i>	<i>Seeds</i>	<i>Length of the plant (in cm)</i>												
		<i>Day 1</i>	<i>Day 3</i>	<i>Day 5</i>	<i>Day 6</i>	<i>Day 7</i>	<i>Day 8</i>	<i>Day 9</i>	<i>Day 10</i>	<i>Day 12</i>	<i>Day 13</i>	<i>Day 14</i>	<i>Day 15</i>	<i>Day 16</i>
10 g	<i>Seed 1</i>	0	0	10.8	16.7	18.6	20.7	21	21.1	21.3	21.4	21.6	22	22.2
	<i>Seed 2</i>	0	0	9.2	15.6	19.5	20.8	21.2	21.3	21.6	21.7	21.8	21.9	21.9
	<i>Seed 3</i>	0	0	8.7	14.8	15.1	15.1	16.2	16.2	16.3	19.1	19.1	19.3	19.5
	<i>Seed 4</i>	0	0	7	12.2	16.2	17.9	18.4	18.7	18.7	19.7	19.9	19.9	20.1
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0
25 g	<i>Seed 1</i>	0	0	8.2	13.4	16.4	17.2	17.8	17.8	18.1	18.1	18.1	18.2	18.5
	<i>Seed 2</i>	0	0	6.4	12.3	16.8	19.2	20	20.2	20.7	20.8	21.3	22	22.3
	<i>Seed 3</i>	0	0	5.8	11.1	15.5	17.9	18.5	18.7	18.9	19.5	18.9	21.6	21.8
	<i>Seed 4</i>	0	0	4.5	4.7	4.8	18.7	19.7	19.8	20.4	20.5	21	21.2	21.1
	<i>Seed 5</i>	0	0	0	6.1	11.8	16.6	17.7	18.1	19.6	19.8	19.9	20.1	20.4
40 g	<i>Seed 1</i>	0	0	8.3	12.3	15.5	16.7	17.7	18.6	18.6	19.1	19.3	21.5	21.8
	<i>Seed 2</i>	0	0	8.4	14.7	19.3	21.3	22	23.1	23.3	24.1	24.1	24.1	24.4
	<i>Seed 3</i>	0	0	0	13.8	17.5	19.2	19.9	20.1	21	21	21.3	21.6	21.7
	<i>Seed 4</i>	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0

<i>Weight of Hair</i>	<i>Seeds</i>	<i>Length of the plant (in cm)</i>														
		<i>Day 23</i>	<i>Day 26</i>	<i>Day 27</i>	<i>Day 28</i>	<i>Day 29</i>	<i>Day 30</i>	<i>Day 33</i>	<i>Day 34</i>	<i>Day 35</i>	<i>Day 38</i>	<i>Day 39</i>	<i>Day 40</i>	<i>Day 41</i>	<i>Day 42</i>	<i>Day 47</i>
10 g	<i>Seed 1</i>	22.6	22.8	22.9	22.9	22.9	23.2	23.9	23.9	24.1	24.3	24.3	24.4	24.5	24.6	24.9
	<i>Seed 2</i>	22.5	23.2	23.3	23.4	23.5	23.5	23.7	23.7	23.8	23.9	23.9	WR	0	0	0
	<i>Seed 3</i>	21.6	21.8	21.9	21.9	21.9	22	22.1	22.2	22.3	22.4	22.4	22.5	WR	0	0
	<i>Seed 4</i>	18.6	18.9	18.9	18.9	18.9	19	19.2	19.3	19.3	19.8	19.8	19.9	WR	0	0
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25 g	<i>Seed 1</i>	18.6	18.7	18.8	18.9	18.9	19	19.1	19.2	19.3	19.8	19.8	19.9	20.1	20.2	20.7
	<i>Seed 2</i>	22.6	22.8	22.9	22.9	22.9	23	23.1	23.2	23.3	23.4	23.8	23.9	23.1	23.2	23.6
	<i>Seed 3</i>	22.6	22.9	22.9	22.9	22.9	23.2	23.4	23.4	23.5	23.8	23.8	23.9	24.1	24.2	24.5
	<i>Seed 4</i>	22.6	22.9	22.9	23.1	23.2	23.5	24.3	24.4	24.5	24.6	24.9	25.1	25.2	25.3	25.5
	<i>Seed 5</i>	21.3	21.5	21.6	21.7	22.2	22.2	22.3	22.4	22.5	22.8	22.6	22.7	22.8	22.9	22.9
40 g	<i>Seed 1</i>	22.1	22.3	22.4	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Seed 2</i>	25.6	25.4	25.9	25.6	25.7	25.7	25.8	25.9	26.1	26.2	26.6	26.7	26.8	26.9	25.2
	<i>Seed 3</i>	23	23.2	23.3	23.4	23.5	23.7	24.6	24.7	24.8	24.8	24.9	25.1	25.2	25.3	25.1
	<i>Seed 4</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Seed 5</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 5B: EFFECT OF FEMALE >15HAIR ON THE LENGTH OF THE LEAVES

<i>Weight Of Hair</i>	<i>Seeds</i>	<i>Length of the Leaves (L1, L2, L3,...) (in cm)</i>											
		<i>Day 1</i>	<i>Day 3</i>	<i>Day 5</i>	<i>Day 6</i>	<i>Day 7</i>	<i>Day 8</i>	<i>Day 9</i>	<i>Day 10</i>	<i>Day 12</i>	<i>Day 13</i>	<i>Day 14</i>	<i>Day 15</i>
10 g	Seed 1	0	0	2.5 2.4	3.3 3.6	4.1 4.4	4.2 4.6	4.3 4.7	4.4 4.7	4.5 4.7	4.6 5.1	4.7 5.3	4.7 5.4
	Seed 2	0	0	1.9 2.9	2.6 3.0	2.4 4.2	3.1 4.5	5.1 4.5	5.1 5	5.2 5.1	5.7 5.1	5.9 5.3	5.9 5.3
	Seed 3	0	0	2.3 2.0	2.7 2.8	3.7 4.3	3.8 4.4	4.7 4.7	4.8 4.8	4.8 5.1	4.8 5.1	4.9 5.3	4.9 5.4
	Seed 4	0	0	1.8 1.6	2.4 2.3	3.5 3.5	4.0 3.9	4.1 4.6	4.3 4.7	4.5 4.8	4.6 4.9	4.8 4.9	4.8 4.9
	Seed 5	0	0	0	0	0	0	0	0	0	0	0	0
25 g	Seed 1	0	0	2.0 2.2	2.7 2.4	3.5 3.2	3.5 3.2	3.8 3.2	3.8 3.2	3.8 3.4	3.9 3.5	4 3.8	4.1 3.8
	Seed 2	0	0	2.2 1.5	3.1 3.2	4.5 4.3	4.8 5	5.1 5.2	6 6.1	6.1 6.1	6.1 6.2	6.6 6.3	6.7 6.4
	Seed 3	0	0	0 0	2.5 3.0	3.2 4.1	3.5 4.4	3.7 4.9	4.3 4.9	4.5 4.9	4.6 4.9	4.8 4.9	4.8 5.1
	Seed 4	0	0	0 0	2.4 2.6	3.5 3.6	4.2 4.3	4.1 4.6	4.1 4.7	4.2 4.7	4.5 4.7	4.8 4.9	5.1 4.9.
	Seed 5	0	0	0 0	1.9 1.9	3. 3.1	3.5 3.6	3.6 3.8	4.6 3.9	4.7 3.9	4.2 3.9	4.3 3.8	4.5 4.1
40 g	Seed 1	0	0	2.3 2.1	2.5 2.6	3.6 3.4	4 4.1	4.2 4.8	4.2 4.8	4.2 4.8	4.3 4.8	4.4 4.8	4.4 4.9
	Seed 2	0	0	2.5 2.2	2.8 2.5	3.8 3.4	4.3 3.8	4.6 4.6	4.7 4.7	4.7 5.1	4.8 5.2	4.8 5.3	4.8 5.7
	Seed 3	0	0	2.3 2.1	3.0 3.2	4.3 4.6	5.1 5.2	5.6 5.6	5.6 5.6	5.8 5.7	6.1 5.8	6.3 5.8	6 6.1
	Seed 4	0	0	0	0	0	0	0	0	0	0	0	0
	Seed 5	0	0	0	0	0	0	0	0	0	0	0	0

<i>Weight of Hair</i>	<i>Seeds</i>	<i>Length of the Leaves (L1, L2, L3,...) (in cm)</i>																
		<i>Day 16</i>	<i>Day 23</i>	<i>Day 26</i>	<i>Day 27</i>	<i>Day 28</i>	<i>Day 29</i>	<i>Day 30</i>	<i>Day 33</i>	<i>Day 34</i>	<i>Day 35</i>	<i>Day 38</i>	<i>Day 39</i>	<i>Day 40</i>	<i>Day 41</i>	<i>Day 42</i>	<i>Day 47</i>	
10 g	Seed 1	4.9	4.1	4.2	4.4	4.5	4.5	4.6	4.7	4.7	4.8	5.2	5.7	FELL	FELL	FELL	FELL	
		5.6	6.1	6.3	6.4	6.5	6.6	6.7	6.7	6.7	6.8	6.9	7.2					
			2.1	2.3	2.4	2.5	2.6	2.7	2.7	2.8	2.9	3.9	4.3					
			2.2	4.2	2.4	2.5	2.6	2.7	2.7	2.8	2.9	3.4	3.9					
			1.7	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.9	3.1					
			1.1	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	2.7	2.9					
			2.3	2.4	1.6	1.7	1.8	1.9	1.9	1.9	2.1	3.8	4.6					
			3.3	3.5	2.7	2.8	2.9	3	3.1	3.2	3.3	4.2	4.9					
		Seed 2	5.9	6.6	6.7	6.8	6.9	6.9	6.9	6.9	7	7.1	7.2	7.2	7.3	7.4	7.5	7.9
	5.4		5.2	5.3	5.5	5.6	5.7	5.8	5.8	5.9	6.2	6.3	6.5	6.6	6.7	6.8	FELL	
		Seed 3	5.1	5.6	5.9	5.9	5.9	5.9	6	6.1	6.2	6.3	6.5	6.8	6.9	WR	WR	WR
			5.5	6.0	6.5	6.8	6.9	6.9	7.1	7.2	7.3	7.4	7.5	7.5	7.6			
		Seed 4	4.9	5.6	5.7	5.8	5.9	5.9	6	7.1	7.2	7.3	7.3	7.4	7.3	7.6	7.7	8.2
			5.1	6.1	6.2	6.4	6.5	6.6	6.7	6.7	6.8	6.9	7	7.1	7.1	7.2	7.3	7.9

	<i>Seed 5</i>	0	0	0	0	0	0		0	0	0		0	0	0	0	0
25 g	<i>Seed 1</i>	4.2	5.1	5.3	255	5.6	5.7	5.8	5.8	5.9	6.1	6.2	FELL	0	0	0	0
		3.9	4.6	4.7	4.8	4.9	4.9	5	5.1	5.2	5.3	5.5	FELL				
						2.6	2.7	2.7	2.8	2.9	2.9	3.1	FELL				
						3.3	3.7	3.8	3.9	3.9	3.9	4.3	FELL				
<i>Seed 2</i>	6.8	7.1	7.3	7.4	7.5	7.6	7.7	7.7	7.8	7.9	8.1	FELL	0	0	0	0	
	6.7	7.1	7.4	7.6	7.7	7.7	7.8	7.8	7.9	8.1	8.3	FELL					
		0.3	0.4	0.3	0.4	0.4	0.5	0.5	0.6	0.7	1.2	FELL					
		0.6	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.9	FELL				
		0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.7	1.9	FELL				
<i>Seed 3</i>	4.9	5.7	5.9	5.9	5.5	5.6	5.8	5.9	6.1	6.2	6.3	6.9	7.1	7.2	7.3	7.9	
	5.2	5.5	5.7	5.9	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.8	7.9	8.1	8.2	FELL	
<i>Seed 4</i>	5.3	5.7	5.9	5.9	5.6	5.7	5.8	5.8	5.9	6.6	FELL	0	0	0	0	0	
	5.2	5.8	5.9	5.9	5.6	6.2	6.3	6.3	6.4	6.5	FELL						
		0.1	0.6	0.7	1.1	1.2	1.2	1.2	1.3	1.4	FELL						
		1.3	1.4	1.6	2.1	2.2	2.3	2.3	2.4	2.5	FELL						
		1.7	1.9	1.9	2.5	2.6	2.7	2.7	2.9	3.1	FELL						
		2.2	2.6	2.7	2.7	2.8	2.9	2.9	3.1	3.2	FELL						
		2.2	2.4	2.9	3	3.1	3.2	3.2	3.4	3.5	FELL						
		0.2	0.1	2.9	1.1	1.3	1.7	1.8	2.1	2.4	FELL						
<i>Seed 5</i>	4.6	4.9	4.9	4.9	5.7	5.8	5.9	5.9	6	6.1	6.4	6.6	6.7	FELL	0	0	
	4.2	4.9	4.9	4.9	4.9	4.9	5	5.1	5.2	5.3	5.5	5.8	5.9	FELL			

			0.7 1.2	0.9 1.3	0.9 1.6	1.5 2	1.6 2.1	1.7 2.1	1.8 2.2	1.8 2.3	1.9 2.4	2.3 2.4	2.9 2.5	2.9 2.6	FELL FELL			
40 g	Seed 1	4.6 5.1	5.2 FELL	5.7 FELL	5.9 FELL	WR FELL	WR FELL	WR FELL	WR FELL	WR FELL	WR FELL	WR FELL	WR FELL	WR FELL	WR FELL	WR WR	WR WR	
	Seed 2	4.9 5.9 2.2 1.7 2.5	5.6 6.2 2.4 1.9 2.7	5.7 6.3 2.6 1.9 2.9	5.9 6.6 2.7 1.9 2.9	5.9 6.7 2.8 1.9 3.5	5.9 6.8 2.9 1.9 3.6	6.1 6.9 2.9 1.9 3.7	6.2 6.9 3.2 1.9 3.7	6.3 6.9 3.2 2.1 3.8	6.6 7.1 3.3 2.2 3.9	6.7 7.2 3.4 2.3 4.1	6.9 7.2 3.7 2.4 4.2	6.9 7.3 3.9 2.5 4.4	FELL	0	0	
	Seed 3	6.1 6.1	FELL 6.2	FELL 6.5	FELL 6.8	FELL 6.9	FELL 6.9	FELL 7.1	FELL 7.1	FELL 7.2	FELL 7.3	FELL 7.4	FELL 7.5	FELL 7.6	FELL	WR FELL	WR 0	WR 0
	Seed 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Seed 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 6: COMPARISON OF EFFECT OF DIFFERENT HAIR SAMPLES ON THE LENGTH OF LABLAB PURPUREUS ON DAY 47

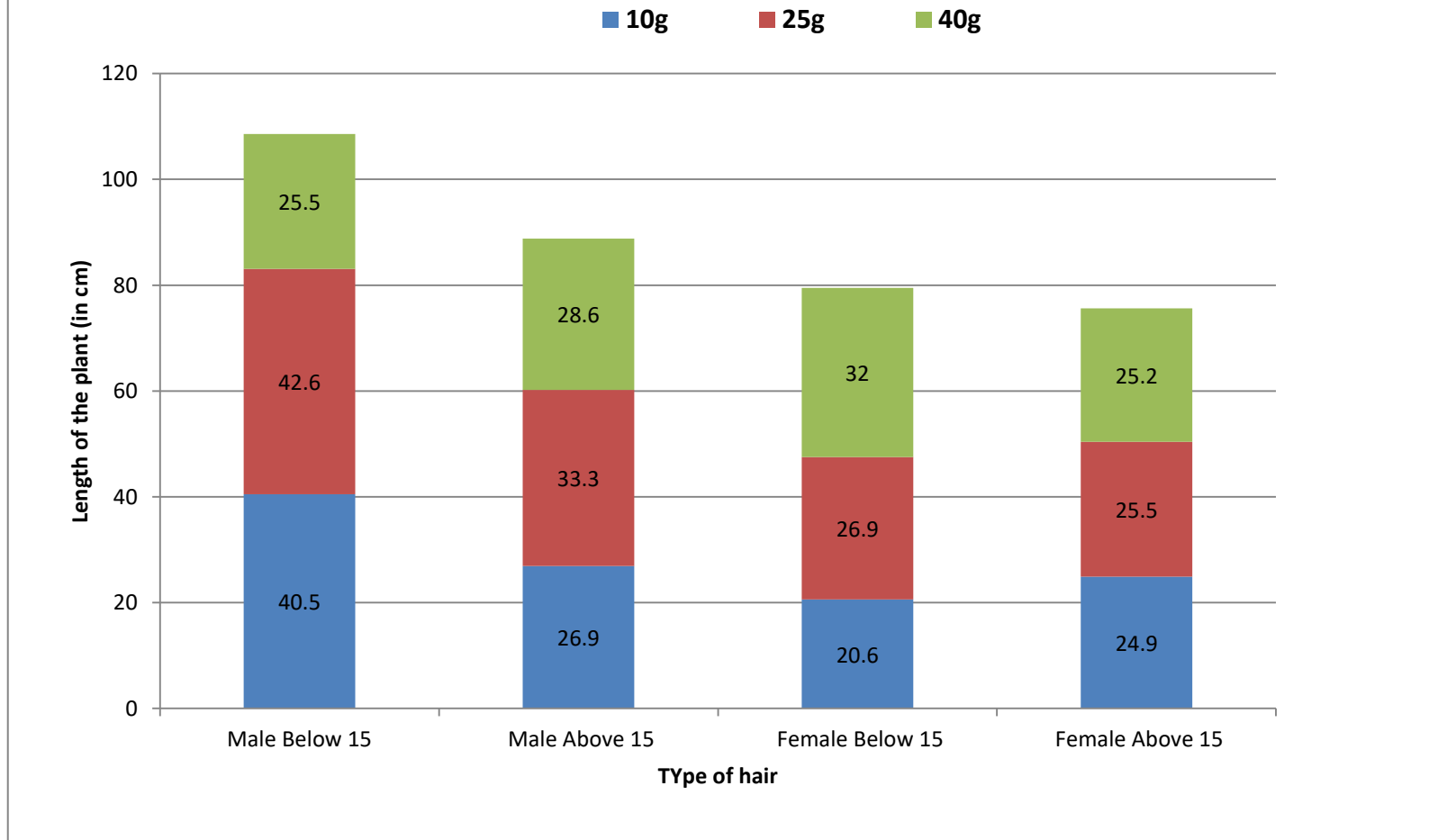
Weight of hair	Seeds	Length of the plant (in cm) on Day 47			
		Male Below 15	Male Above 15	Female Below 15	Female Above 15
10g	<i>Seed 1</i>	40.5	23.2	20.6	24.9
	<i>Seed 2</i>	40.2	24.7	0	0
	<i>Seed 3</i>	16.9	26.9	0	0
	<i>Seed 4</i>	22.9	17.9	0	0
	<i>Seed 5</i>	0	22.6	0	0
25g	<i>Seed 1</i>	42.6	26.6	0	20.7
	<i>Seed 2</i>	23.9	23.6	0	23.6
	<i>Seed 3</i>	31.5	33.3	0	24.5
	<i>Seed 4</i>	20.9	28.9	0	25.5
	<i>Seed 5</i>	22.9	28.9	26.9	22.9
40g	<i>Seed 1</i>	25.5	28.6	24.5	0
	<i>Seed 2</i>	25.5	27.9	0	25.2
	<i>Seed 3</i>	10.5	25.9	0	25.1
	<i>Seed 4</i>	11.2	0	32	0
	<i>Seed 5</i>	0	0	0	0

Table 6: COMPARISON OF EFFECT OF DIFFERENT HAIR SAMPLES ON THE LENGTH OF LABLAB PURPUREUS

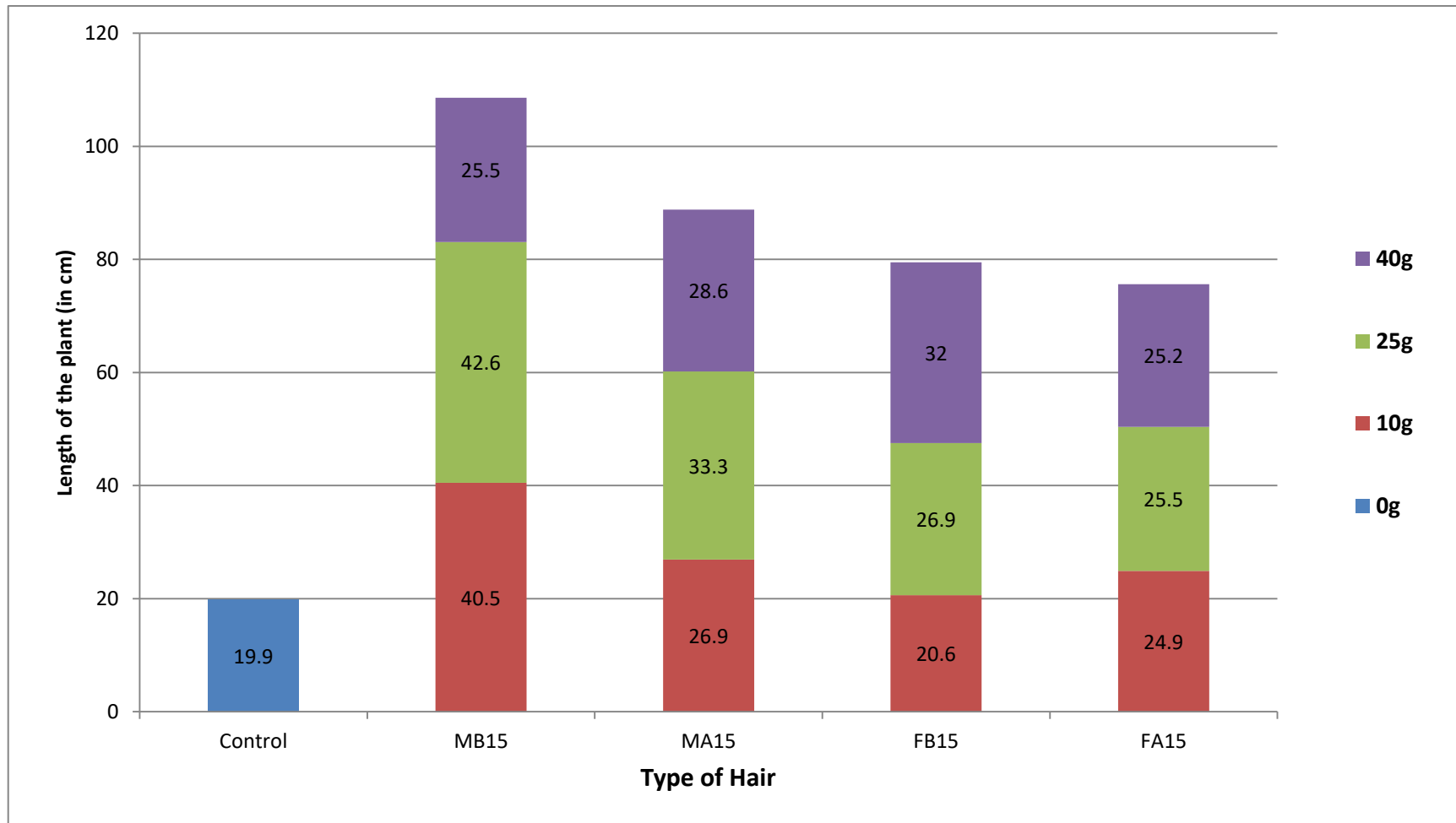
Weight of hair	Consolidated Length of the plant (in cm)			
	Male Below 15	Male Above 15	Female Below 15	Female Above 15
10g	40.5	26.9	20.6	24.9
25g	42.6	33.3	26.9	25.5
40g	25.5	28.6	32	25.2

GRAPHICAL REPRESENTATION

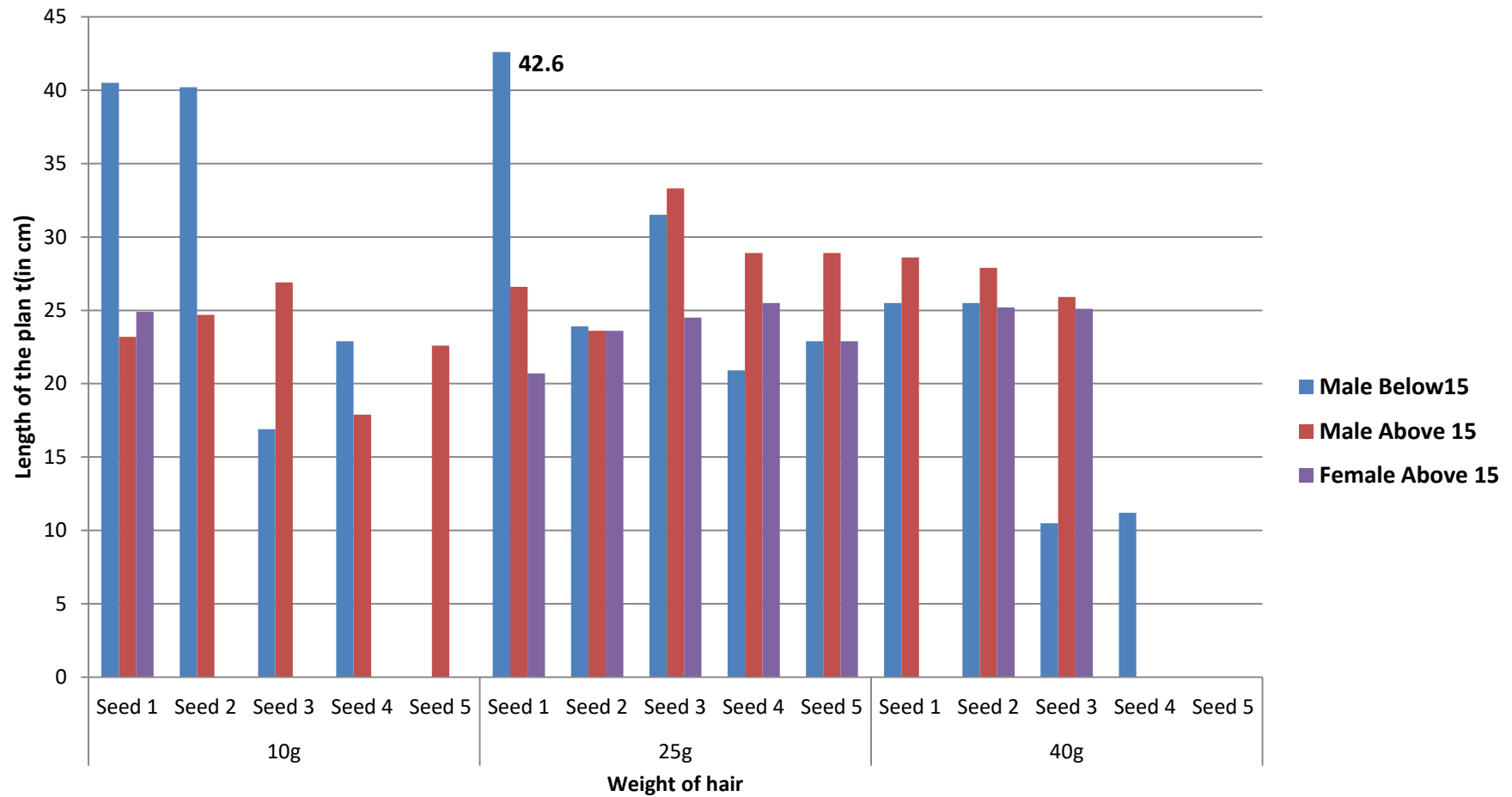
Graph1: COMPARISON OF EFFECT OF DIFFERENT HAIR SAMPLES ON THE LENGTH OF *Lablab purpureus*



COMPARISON OF EFFECT OF DIFFERENT HAIR SAMPLES ON THE LENGTH OF *Lablab purpureus* INCLUDING CONTROL



Graph 2: COMPARISON OF EFFECT OF DIFFERENT HAIR SAMPLES ON THE LENGTH OF *Lablab purpureus* ON DAY 47



RESULTS AND DISCUSSION

- On the Day 3, all the pots got sprouted out.
- First few days, female hair containing plants grows better than male. After few days there is sudden change in the plant growth and it changes the result.
- On Day 5, some of the plants were damaged by insects.
- For the first 9 days, I observed some of the different growth in the male 10g and after 10th day it is identified that the plants are grown upside down position where leaves arises from the soil and the root is seen on the top of the soil.
- Seed 4 and 5 in control, did not grow upto 47th day.
- On 23rd day, in Seed 2 in control, stem was broken by wind and it stops its growth.
- In Control pot all the plants were dried out and leaves were wrinkled on 33rd day and there is no plants were seen in control pot and shows that lack of nutrients affect the plant growth in control.
- Seed 5 in male less than 15 has not germinated.
- Up to 15th day, male <15 (25g) seed 1 grows faster than other plants.
- **Male <15, seed 2, 3 & 4 was damaged by insects on 23rd day and it reduces the stem height.**
- In Female <15, there is no growth seen in seed 4 & 5 in 10g and seed 3 & 5 in 40g.
- Seed 2 & 3 in Female <15 (25g) turns into yellow colour and get wrinkled on 40th day.
- On 23rd day in seed 1 & 2 in Female <15, all the leaf and stem were damaged by insects and its remaining stem was stand on and there is no plant parts were seen on 47th day.
- Seed 2 in Female >15 (10g) get wrinkled on 40th day and it stops growing.
- No plants were seen in female >15 (10g) on 41st day.
- Secondary leaves arises on 10th day in some of the plants in Male<15 and Male >15.
- **On 23rd day, tertiary leaves are formed.**
- I spread neem-cake water to reduce the insects that damaged the leaves on day 28.
- In tabulation **GM denotes germination, SP – Sprouted, NL- No leaf, NG- NO GROWTH, F-Leaf FELL.**

- I had Diwali holidays from Day 17 to Day 22. However, I ensured that the plants were watered with correct quantity everyday through our school gardener with the help of my Principal. But I couldn't note the growth of the plant in that duration. Even, I thought of shifting the setup to my home. When I consulted my guide regarding this, she explained me that the plants should not be exposed to different environment so often during the project duration as it may vary the results.

In a nut-shell:

- For the comparison purpose, I have taken the seed with maximum height on final day (Day 47) as the final height of the plant. For control I have considered Day 29.
- On an average, Male hair induces growth better than female's.
- Comparing age group, the length of the plant was greater for below 15 ages in both genders.
- Increasing the weight of hair seems to increase the height of the plant, (10g to 25g), but the length slowly decreases above 25 g, that is, for 40g except in case of Female below 15.
- Results from this study suggest that male hair waste could be used as a nutrient source for container-grown plants.

On the whole, Decreasing order of plant height:

- **Male Below 15 > Male Above 15 > Female Below 15 > Female Above 15**
- *The only Exception was in case of weight 40 g.*
- **Female Below 15 > Male Above 15 > Male Below 15 > Female Above 15**

In all the comparative cases, *Female Above 15 seems to have lower plant height.*

APPLICATION

- Human hair could be used instead of chemical fertilizers for some plants.
- Human hair boosts both nutrient efficiency and organic matter content in the soil.
- Human hair provides nitrogen and other nutrients for plants as it decomposes. Decomposition of hair takes more time but it fixes nitrogen in the soil and that will be helpful for plant growth.
- Hair easily fixes nitrogen in the root knot of legumes plants. Plant yields increased for the hair-fertilized plants compared to the untreated control plants.
- Plant growth will be effective in male hair because male hair has more protein level.
- The hair that compose organic-based fertilizers, the beneficial natural processes they generate, and the ways in which they are produced contribute to the sustainable, resource-efficient and low-carbon economy.
- Facilitate the slow release of nutrients in response to the dynamic needs of plants.
- Human hairs enhance crop resistance to erosion by improving the soil's organic matter content.

CONCLUSION

My hypothesis, “Male hair of age group below 15 will give comparatively better plant growth” **has been proved.** Human **Hair** combined with compost is **Good** Fertilizer for **Plants**. This study has shown that human **hair**, a readily available waste generated from barbershops and **hair** salons, combined with additional compost, is an additional nutrient source for the leguminous crops.

FUTURE ENHANCEMENT

- Further research is still needed to see if human hair waste is a viable option for fertilizing edible crops because of possible health concern.

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In a warm- hearted state and with intense pleasure, I bow myself and adore the ALMIGHTY for his grace and immeasurable blessings showered upon me all throughout my life.

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Our school co-workers encourage me to take up this challenge and provided me with useful tips to help, write the final report in the correct format. My parents provided emotional support throughout the project. Last but not the least, my sincere thanks to all of my friends who have patiently extended all sorts of help in this project.

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