

# **REPORT OF HYDRETAIN TRIAL ON ICEBERG LETTUCE (LUCTUCA SATIVA)**

**SAN NICOLÁS DE CARTAGO,  
COSTA RICA**

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**AGROCOSTA S.A**

## **Introduction**

Agrocosta S.A performs a test to measure Hydretain's performance in iceberg lettuce (*Lactuca sativa*). This product improves water absorption in plants, delaying the wilting period and therefore the amount of irrigation required for the plant to reach a proper behavior, consequently savings in water used in our crops. This test is performed at San Nicolás de Cartago, at a height above sea level of 1300 meters.

## **General Objective**

To evaluate the influence of Hydretain in normal behavior of iceberg lettuce crop (*Lactuca sativa*)

## **Specific objective**

To determine the effect Hydretain has on iceberg lettuce (*Lactuca sativa*).

## **Hypothesis**

Hydretain has positive effect(s) on iceberg lettuce (*Lactuca sativa*).

## **Materials and methods**

### **Location of the study**

The experimental plot is located in San Nicolas, the third district of the province of Cartago, Costa Rica and held in April 2012.

### **Experimental material**

To determine the sampling units, the center of the bed was taken as starting point, which is the boundary with the control, and 16 plants were harvested as a smaller unit of measure. This is similarly repeated in the control bed.

## **Agronomic crop management**

Normal duties are performed recommended for iceberg lettuce (*Lactuca sativa*).

## **Description of the treatments**

The applied dose is recommended by the manufacturer for spaced crops, 9.35 liters per hectare.

One single application of a solution of Hydretain at a rate of 2.06 cc in 9 liters of water in a ground area of 2.2m<sup>2</sup> of iceberg lettuce (*Lactuca sativa*).



**Photo 1 application of Hydretain**

Control does not receive any product application.

## **Variables Studied**

For the study measures will be taken for the total weight of the plant and parts such as: head (leaves), root. In addition to other variables involving production or waste: clean head and dirty head. These measurements will be presented in grams. Harvest will be manual at the same time for the treatment and the control. They will be washed prior to weighing in order to remove excess soil, which can interfere with data collection.

Measurements will be made using a digital roman scale which margin of error is about a gram.

The following pictures illustrate this.



**Photo 2 iceberg lettuce in bed.**





Photo 3 harvested iceberg lettuce

### Total weight of plant



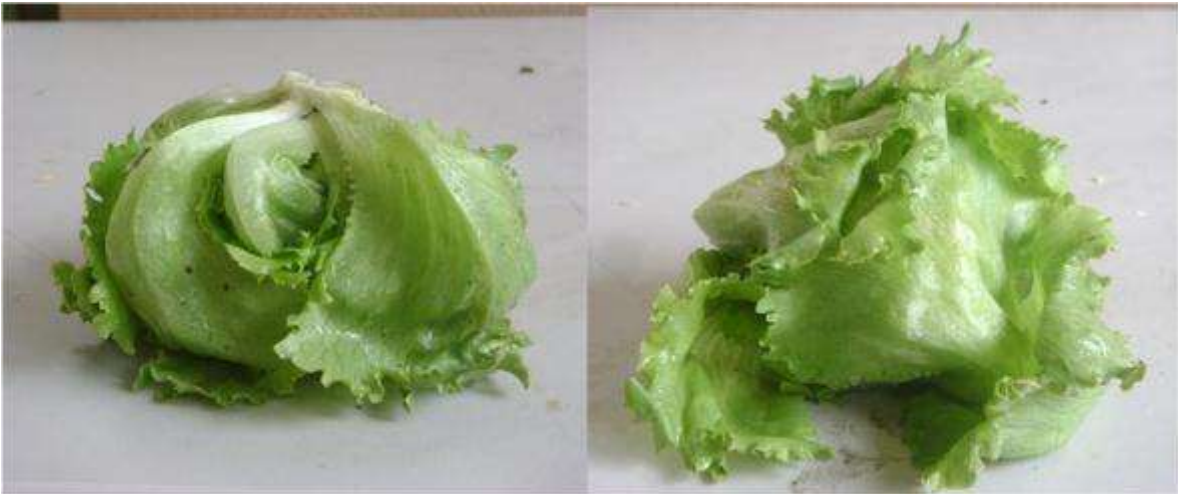
Photo 4 Plant washed

**Dirty head weight (with bad leaves)**



**Photo 5 Dirty head**

**Clean head weight (without bad leaves)**



**Photo 5 clean head**

## Root weight



Photo 6 washed root

## Bad leaves weight



Photo 7 bad leaves for waste



## Experimental Design

As for the experimental design, this will be fully comparative using the tools of Microsoft Excel, graphs and averages.

## Data Analysis

The following table shows results of weighing the samples treated with Hydretain and control.

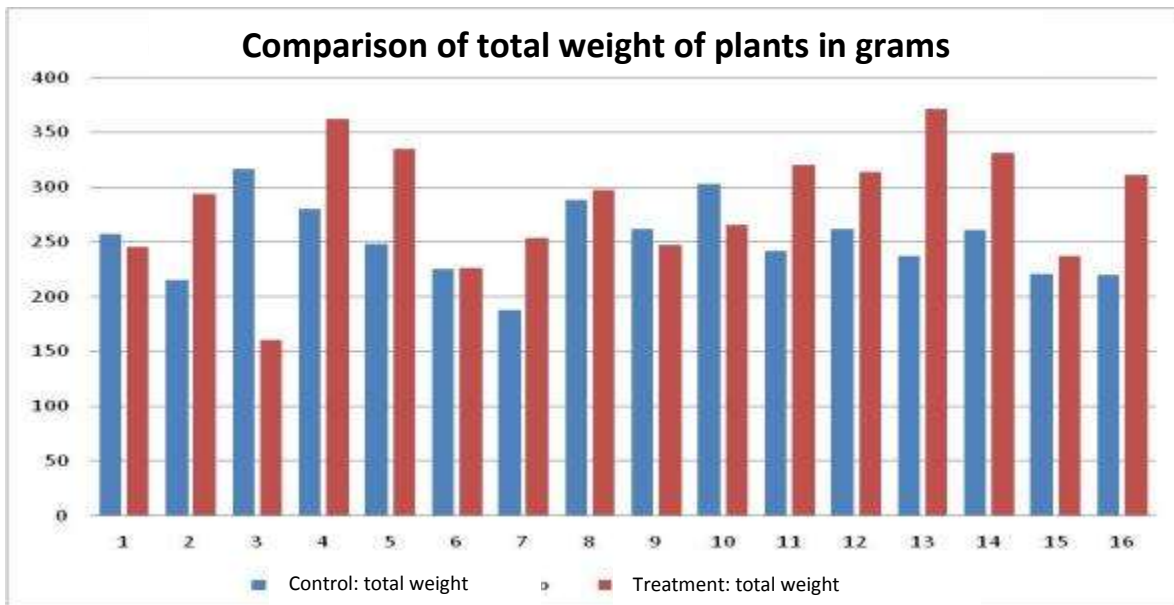
In the graphs shows comparisons of variables in grams

Sample #	Control: total weight by plant	Treated: total weight by plant	Control: dirty head weight	Treated: dirty head weight	Control: clean head weight	Treated: clean head weight	Control: root weight	Treated: root weight	Control: bad leaves weight	Treated: bad leaves weight
1	257	245	244	233	185	195	13	12	59	38
2	215	294	206	285	164	247	9	9	42	38
3	317	160	306	152	217	121	11	8	89	31
4	280	362	272	353	191	310	8	9	81	43
5	248	335	235	318	165	285	13	17	70	33
6	225	226	215	217	156	168	10	9	59	49
7	188	254	179	245	147	212	9	9	32	33
8	288	297	280	287	219	242	8	10	61	45
9	262	247	254	234	218	206	8	13	36	28
10	303	265	291	252	239	216	12	13	52	36
11	242	320	231	306	199	263	11	14	32	43
12	262	314	250	302	217	250	12	12	33	52
13	237	371	225	362	182	308	12	9	43	54
14	261	331	249	308	208	265	12	23	41	43
15	221	237	212	227	171	182	9	10	41	45
16	220	311	210	301	157	247	10	10	53	54
Average:	251,6	285,56	241,2	273,88	189,69	232,31	10,44	11,688	51,5	41,563

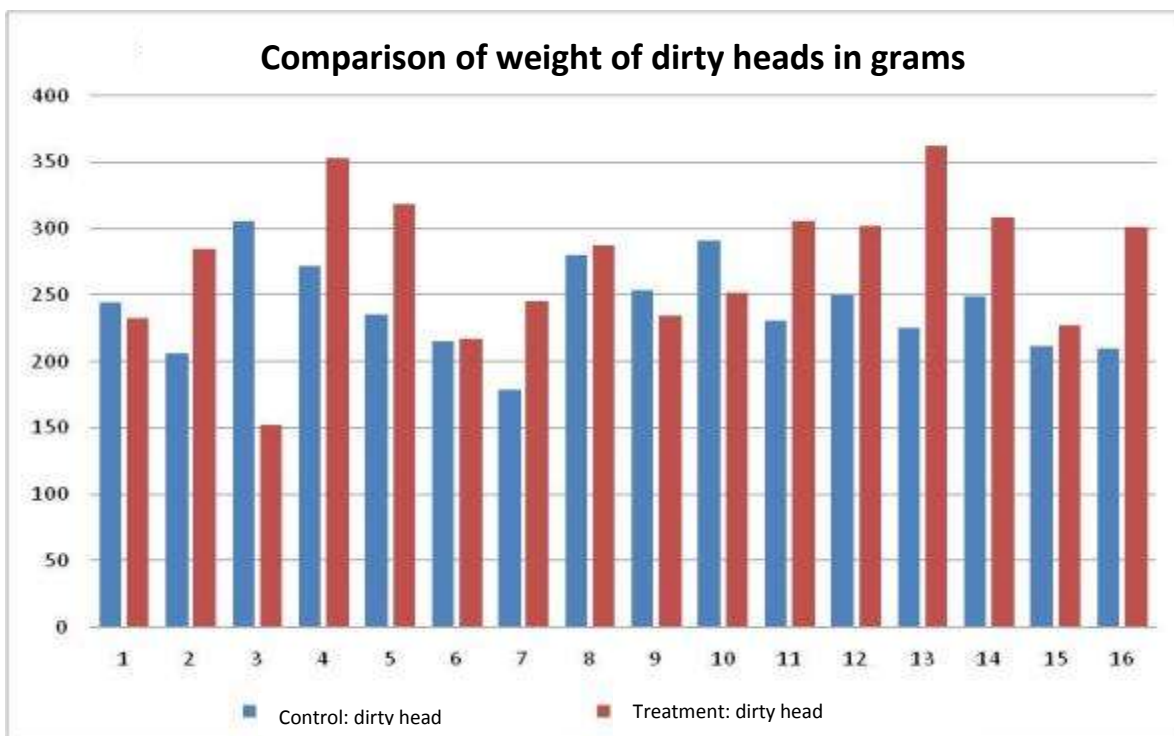
Table 1 weighing data Hydretain treatment and control.



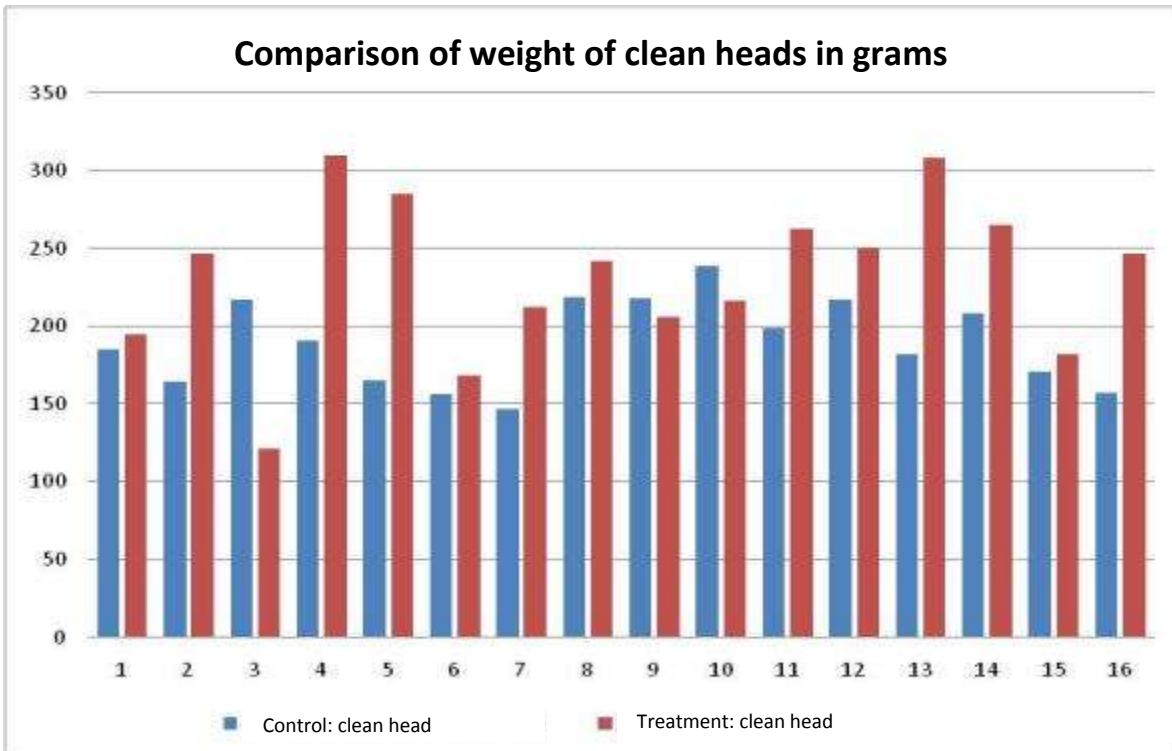
## Comparative graphs per sample



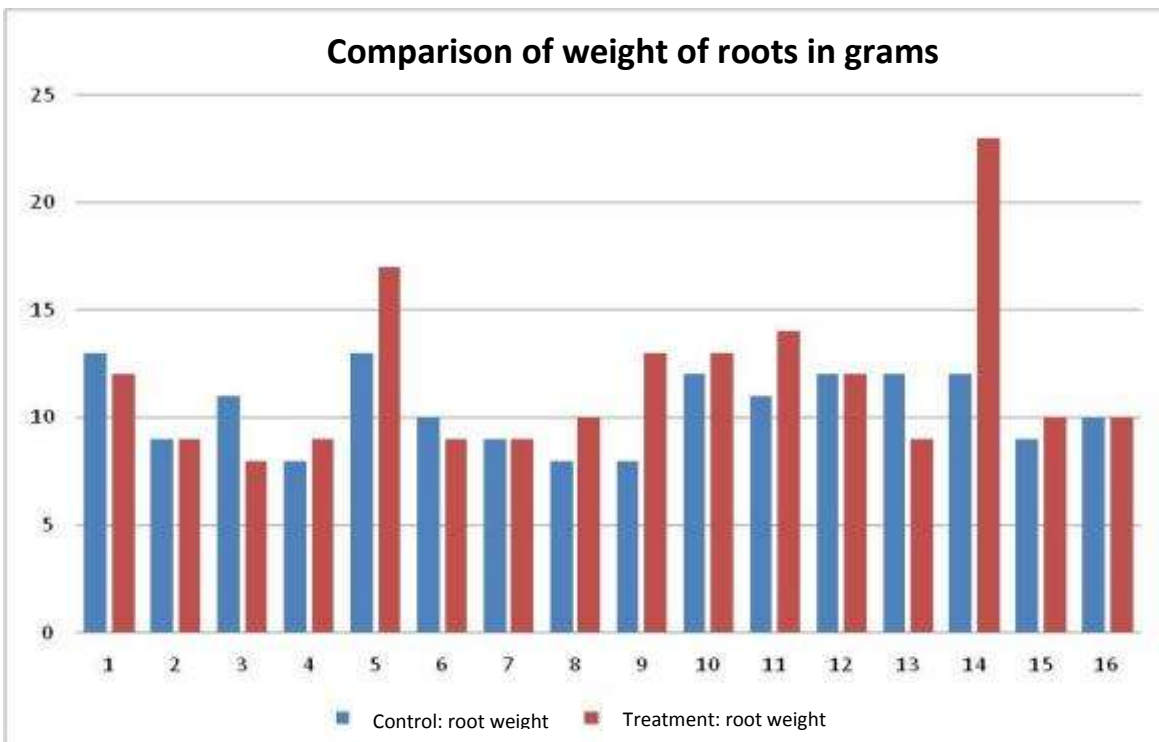
Graph 1



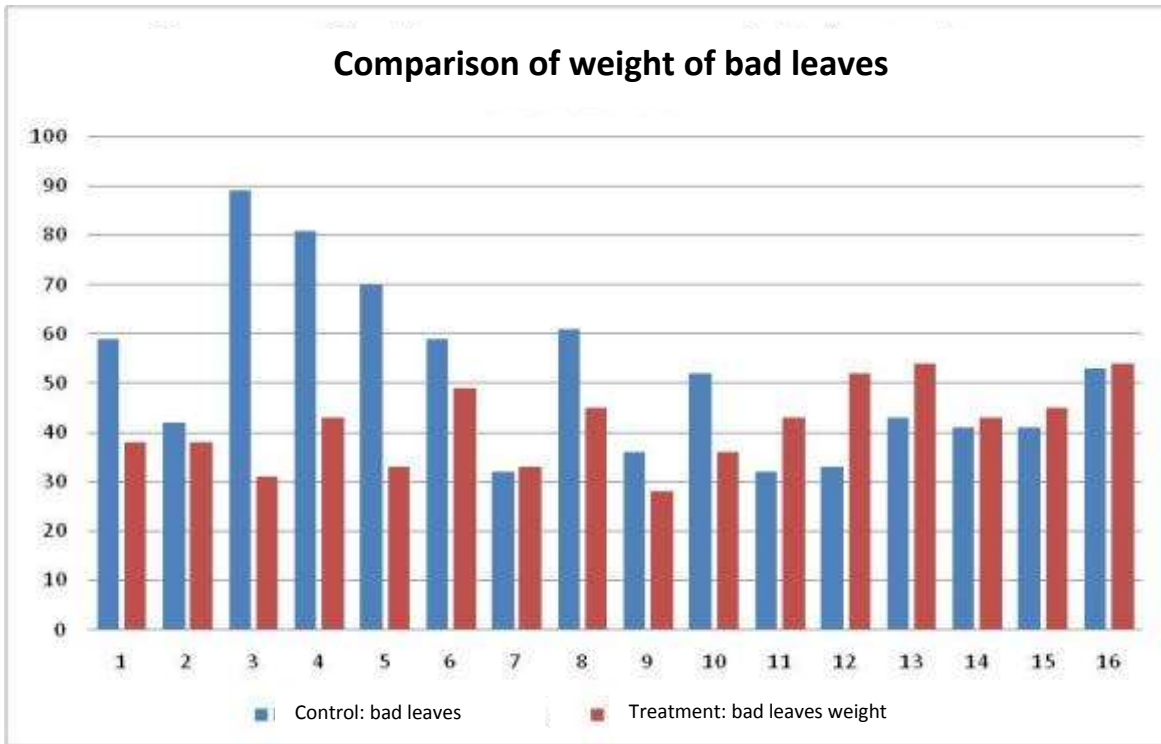
Graph 2



**Graph 3**

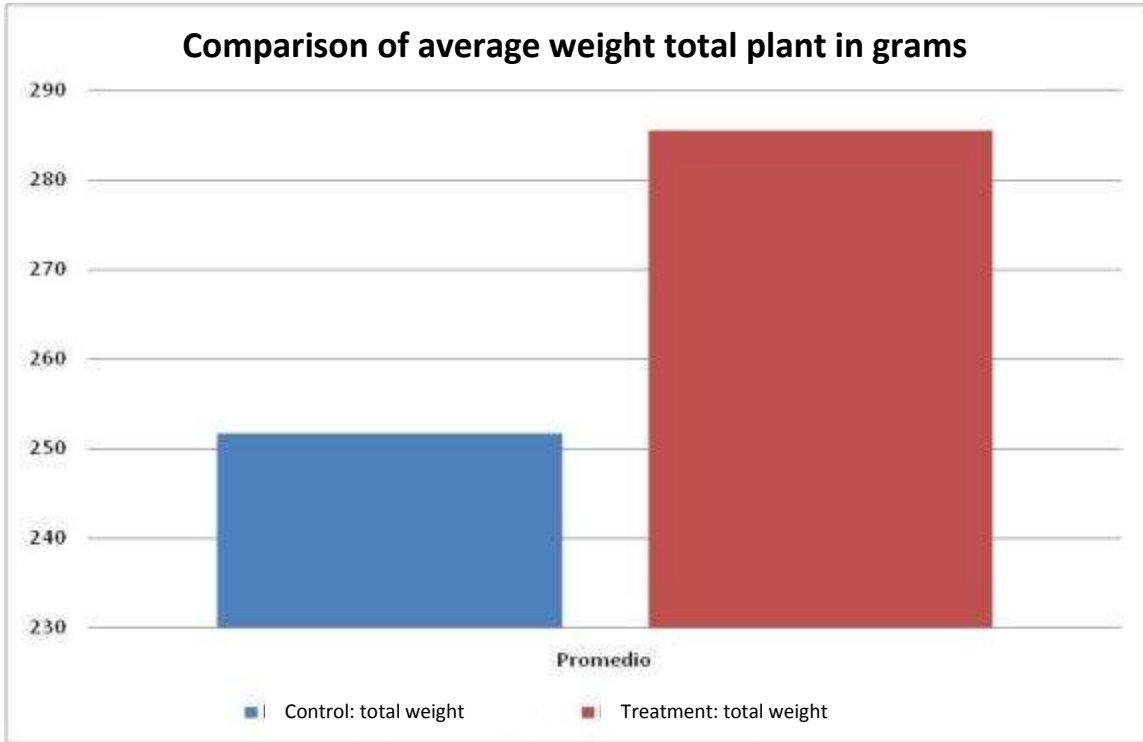


**Graph 4**

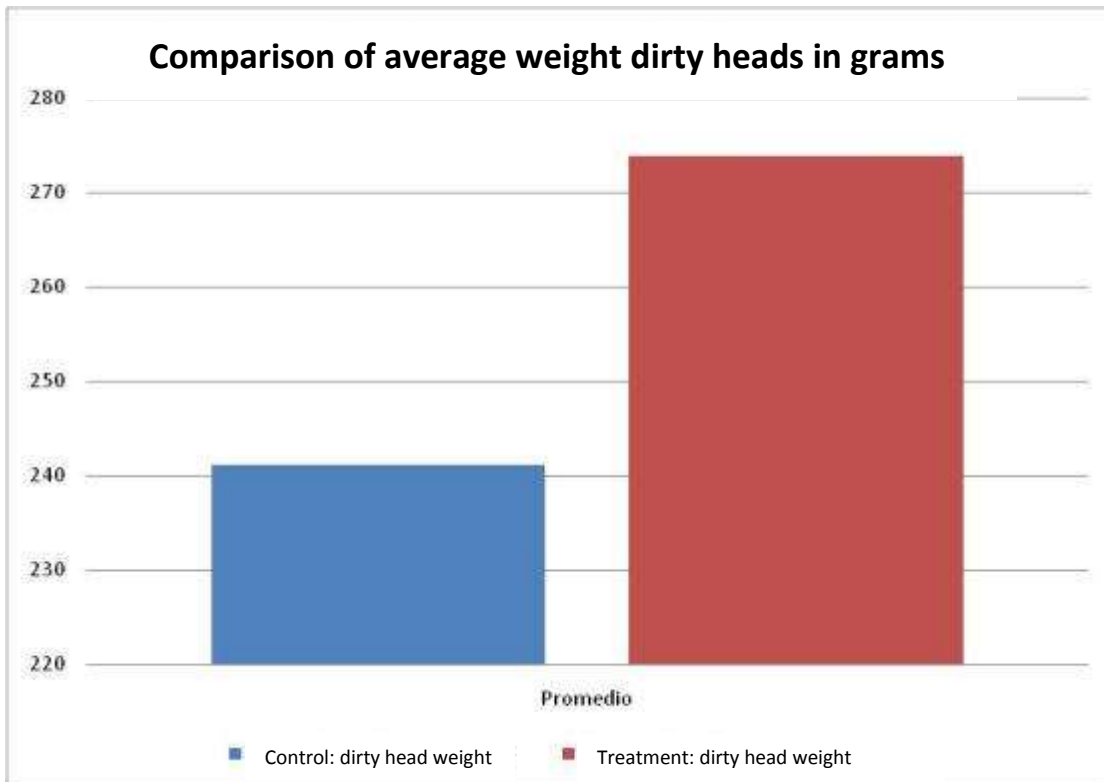


**Graph 5**

## Averages Comparison Charts

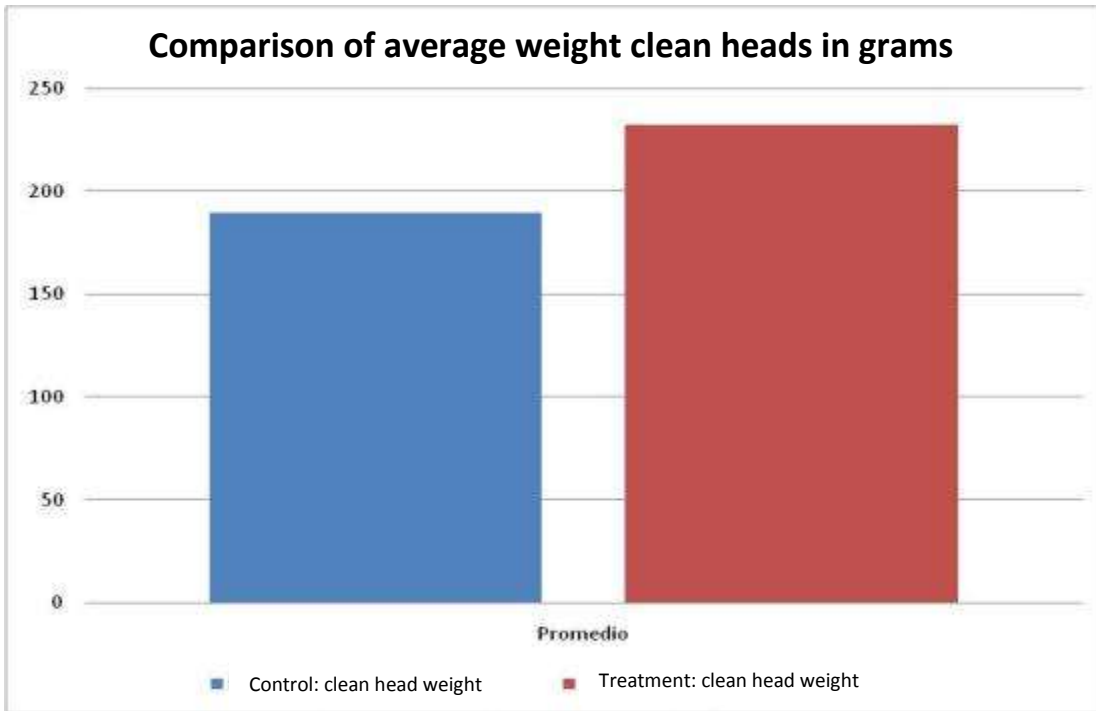


**Graph 6**

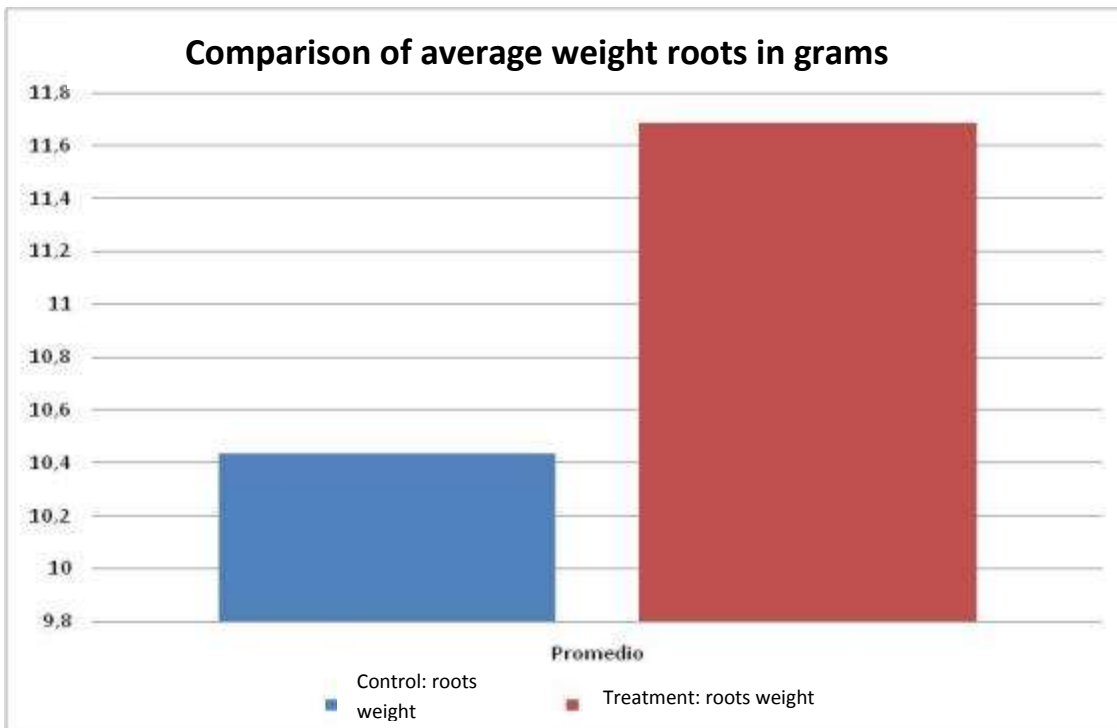


**Graph 7**

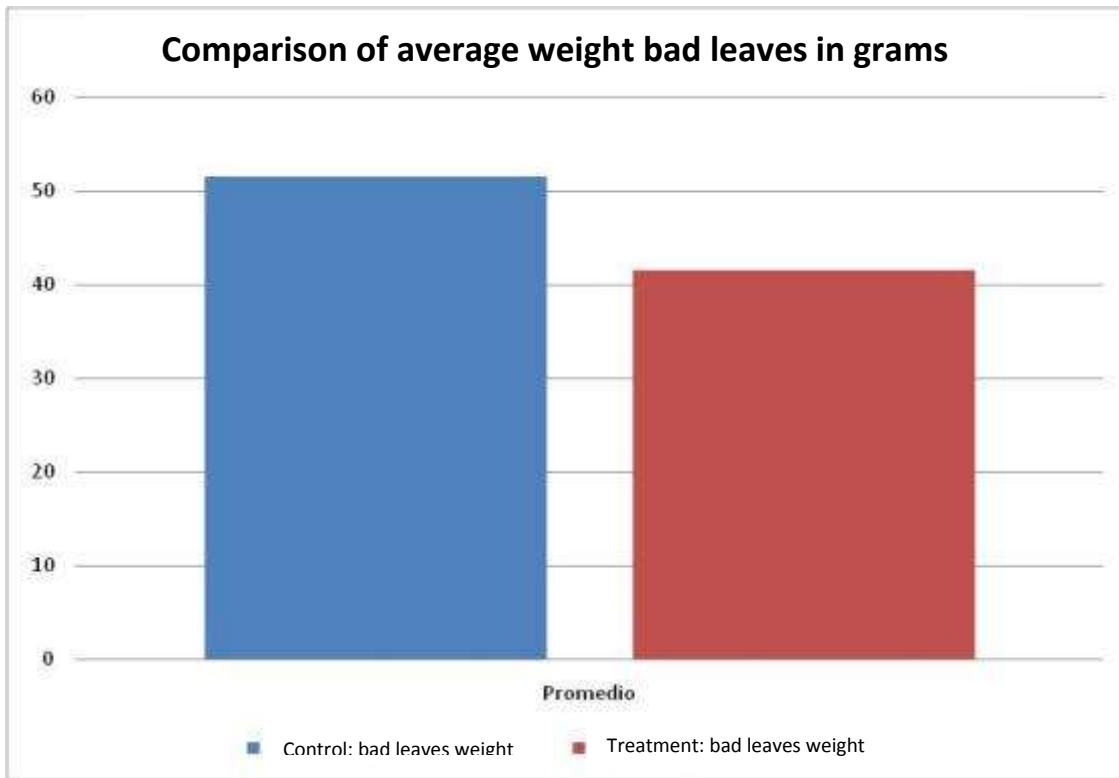




**Graph 8**



**Graph 9**



**Graph 10**

## Conclusions

- In this case the size and weight of root is not related to the size of the head of lettuce.
- The total weight of iceberg lettuce plants (*Lactuca sativa*) with Hydretain treatment were higher compared with the control by an average of 33.96 grams.
- The average weight of soiled and clean head of the iceberg lettuce (*Lactuca sativa*) with Hydretain treatment are greater than the control, 32.68 and 42.62 grams respectively.
- The amount of waste leaves of the lettuce with treatment is lower than the control.
- Lettuces with treatment have greater weights and fewer wasted leaves, resulting in increased production.