A close-up photograph of a green leaf, showing a dense network of veins. The veins are a lighter green color, contrasting with the darker green of the leaf's surface. The veins form a complex, branching pattern across the leaf.

The organic nutrition on hydroponically grown greenhouse melon

H.Y. Dasgan, A. Yucebilgic and O. Altuntas



INTRODUCTION

Soilless vegetable production is an agricultural sector which has a lot of interest and high profit. It showed up for several reasons. Some of them are,

- Soil pollution
- Pathogen contamination
- Soil-borne pathogens



INTRODUCTION

As soilless production has proven to be an alternative to soil sterilization, use of some chemical soil sterilants.



INTRODUCTION

- Organic farming is a system that excludes the utilization of synthetic fertilizers, pesticides, and growth regulators.
- Greenhouse technology and horticultural practices differ little between conventional and organic greenhouse production.
- The main variations are concerned followings; pest control and fertilization.



INTRODUCTION

- The organic fertilizers could supply nutrients at the same level as synthetic fertilizers. Products derived from algae, bat guano, fish waste, mineral rocks, animal manures, plant waste etc.



INTRODUCTION

- Soiless culture, the production of plants in a soiless medium, can be done via hydroponics or with an organic or inorganic substrate. In soiless culture, plants are grown in a soiless medium and fed with fertilizer nutrients dissolved in solution.



AIM

In this study, the certified organic fertilizers were used as nutrients for growing melon plants. The main goal of the study was whether the use of the organic fertilizers in soilless system how performs growing of plants, yield and some fruit properties.



MATERIALS AND METHODS

In the spring growing season (March-June), the experiment was conducted in a research greenhouse at Cukurova University, Faculty of Agriculture (36°59'N, 35°18'E, 20 m above sea level) Adana, Turkey, with melon (*Cucumis melo*).



MATERIALS AND METHODS

Three different kinds of certified-commercial organic fertilizers and a control treatment were used in the experiment.

- Biofarm (Liquid)
- Complex (Liquid)
- Patrone+Chamlica (Powder)
- Control



MATERIALS AND METHODS

The seedlings were transferred into the substrate of perlite and cocopeat mixture in 1:1 ratio on 04 March.



MATERIALS AND METHODS

Biofarm originated from animal waste and contained 35% organic matter, 5% humic acide, 19% fulvic acide, 4% N, 2% P, 3.2% K.



MATERIALS AND METHODS

Complex originated from plant and animal waste and contained 50% organic matter, 3.5%N, 0.1%P, 9.5%K₂O, 0.1%MgO, 1% CaO, 8 ppm Fe, 6 ppm Zn, 4 ppm Mn, 0.1 ppm B, 0.05 ppm Cu, 0.06 ppm Mo.



MATERIALS AND METHODS

Patrone originated from legume plant waste and contained 41.33% organic matter, 10.21% N,
Chamlica originated from sea algae and contained 53% organic matter, 26% alginic aside.



MATERIALS AND METHODS

Control treatment consisted of the following nutrients (ppm) : 155 $\text{NO}_3\text{-N}$, 17 NH_4 , 53 P, 329 P, 120 Ca, 27 Mg, 3 Fe, 0.8 Mn, 0.5 Zn, 0.1 Cu, 0.05 Mo, 0.4 B.



MATERIALS AND METHODS

The melon plants were irrigated with the organic fertilizers in each irrigation time. The open soilless system has been used. The amount of nutrient solution applied in the treatments was determined based on a daily measured drainage fraction from the base of the growth containers.



MATERIALS AND METHODS

Drainage ratio and the irrigation frequencies were controlled and adjusted depending on plant age and greenhouse climatic conditions (temperature and light).



MATERIALS AND METHODS

Melon plants pruned single main vine and fruit obtained from side shoots. Fruit number per plant was between 3-5.

We did not control fruit number by pruning, plants itself controlled the fruit set.



MATERIALS AND METHODS

The melon plants grown under different treatments were compared at the end of the experiment, for the plant growth parameters total yield, and some fruit parameters and leaf nitrogen (N) were investigated.



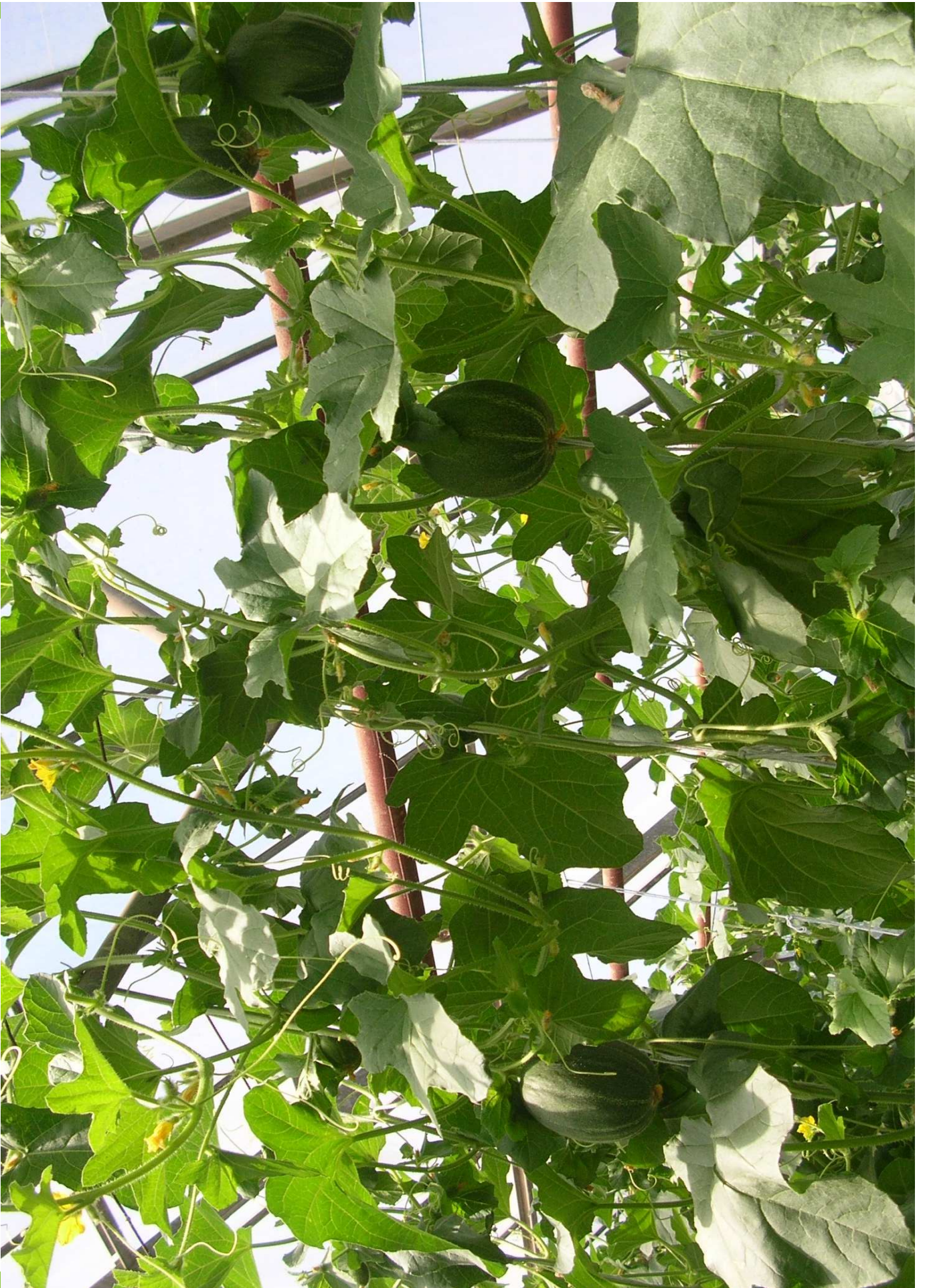










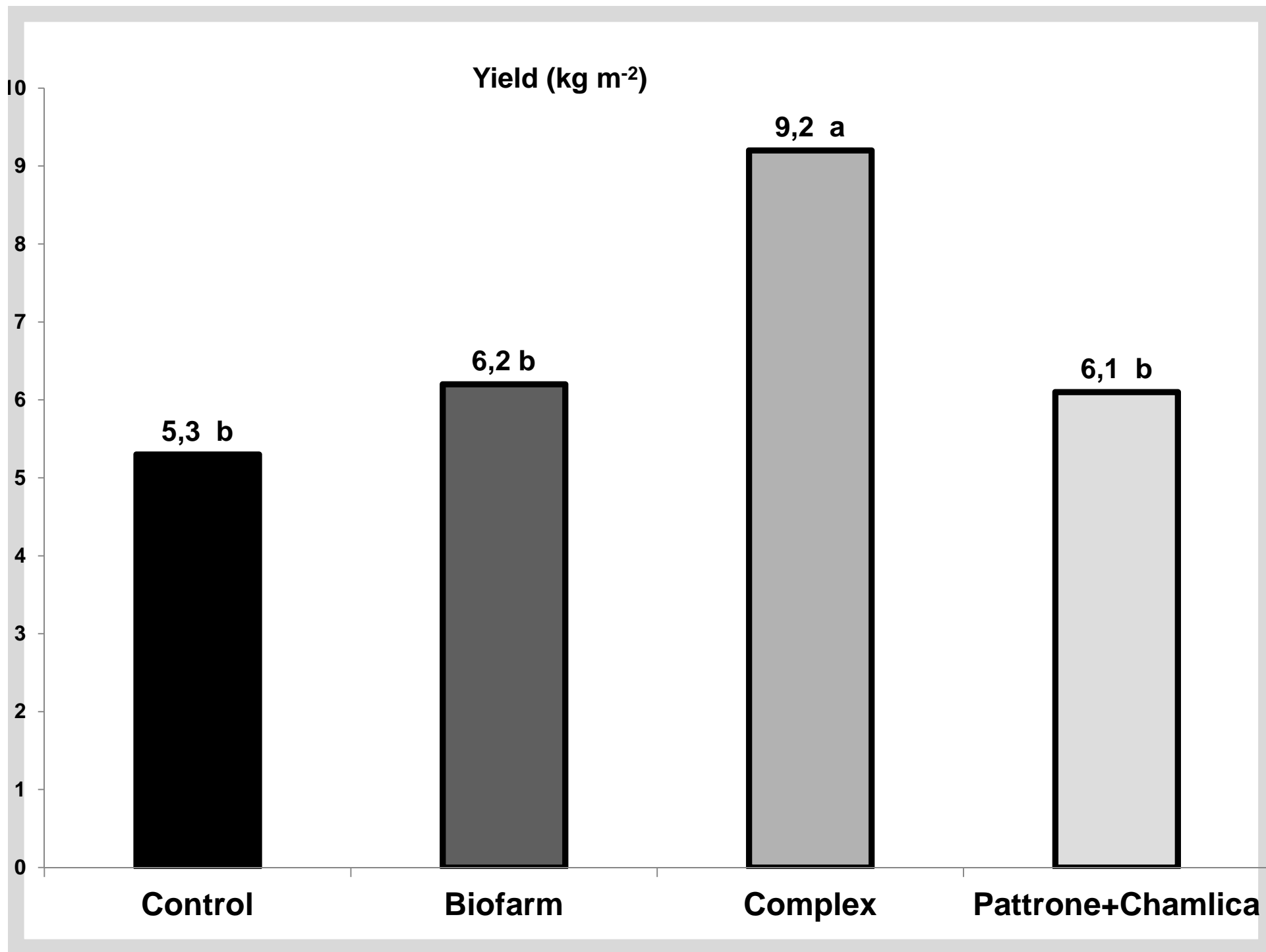




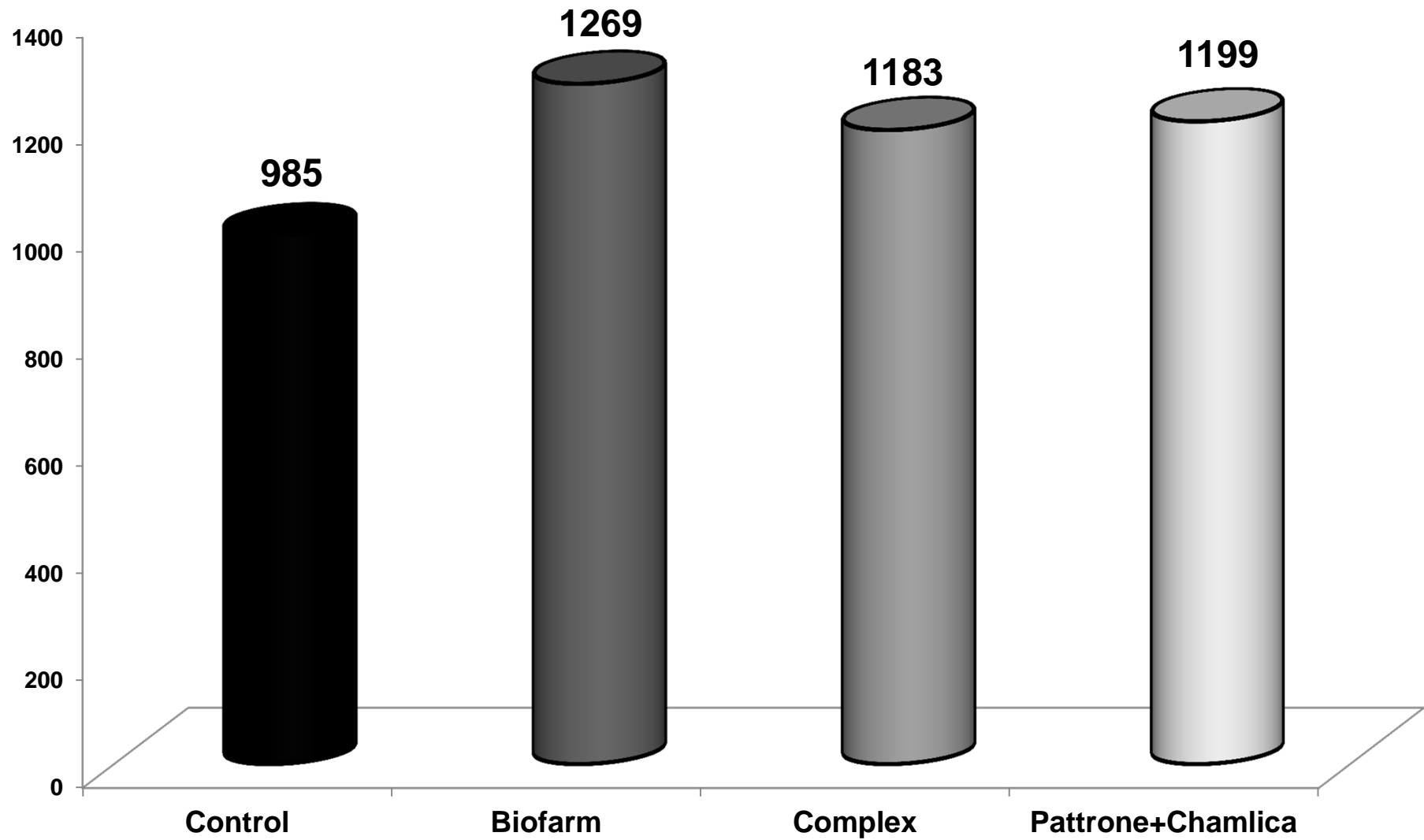


RESULTS

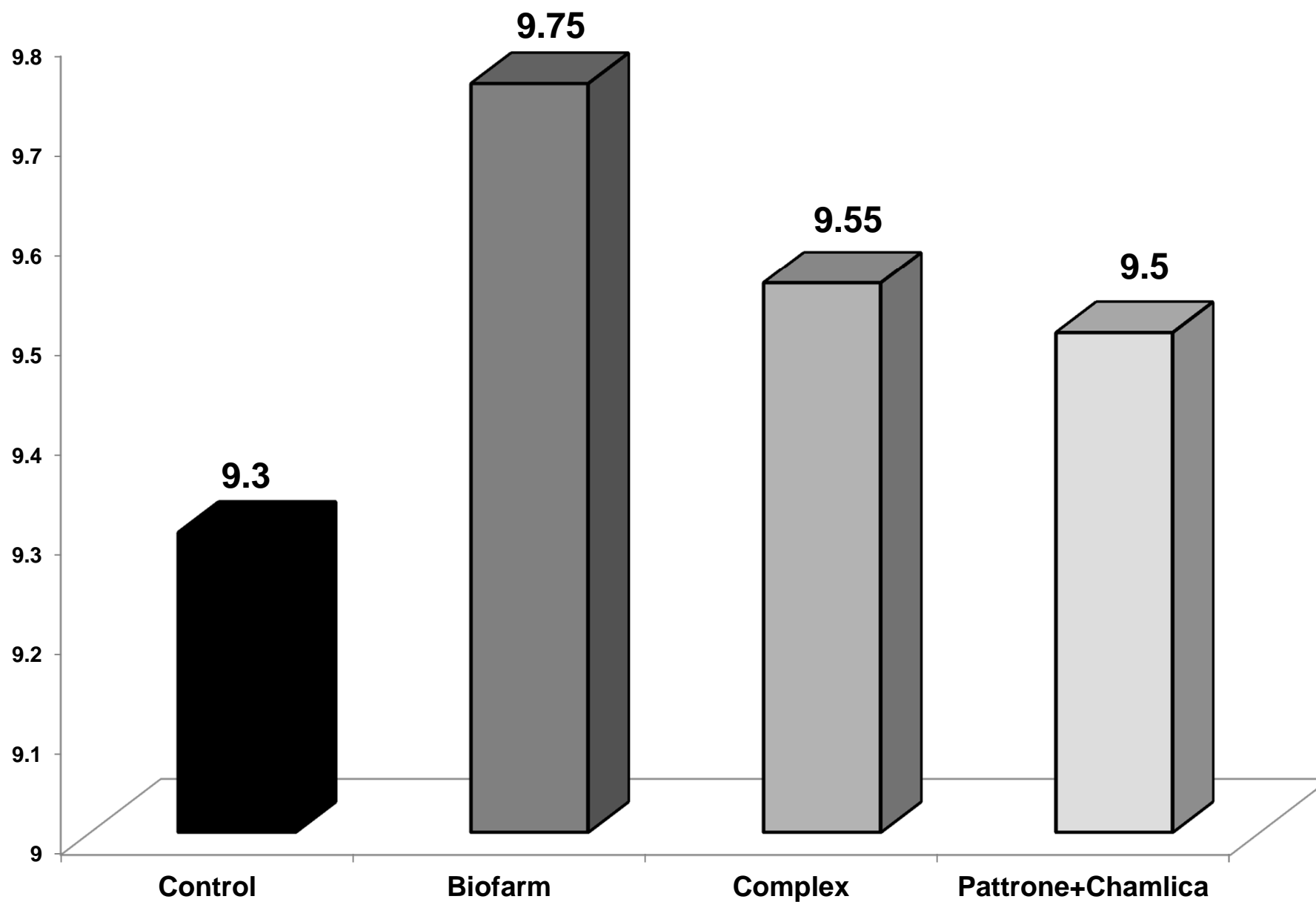
Treatments	Plant Height (cm)	Total Shoot FW (g plant⁻¹)	Number of leaf (Leaf plant⁻¹)	Stem diameter (mm)
Control	398	1043	50.13	10.04 a
Biofarm	431	1051	52.88	7.86 b
Complex	434	1079	51.25	8.52 b
Patrone+Chamlica	422	1066	54.00	8.82 b



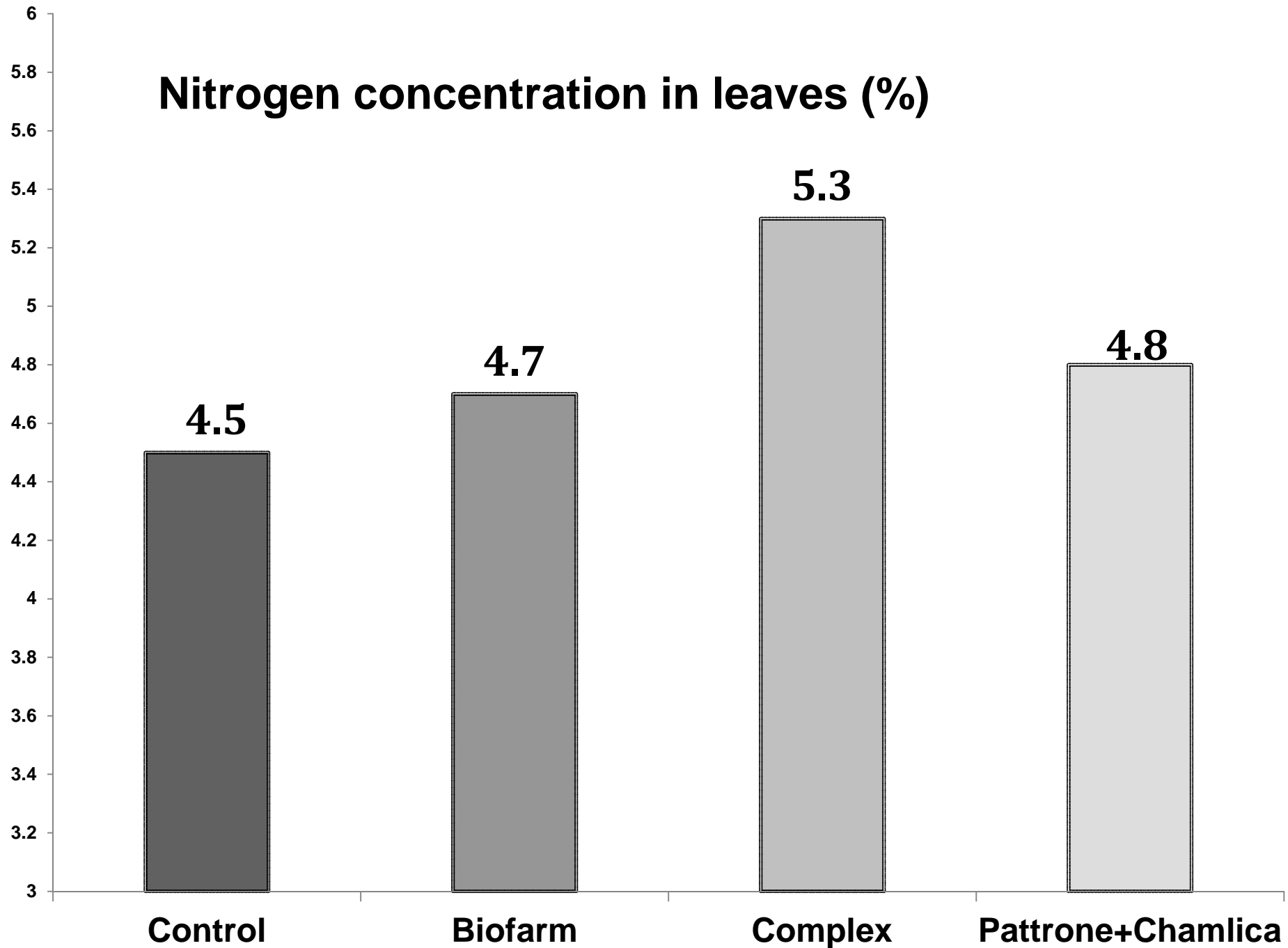
Melon Weight (g)



Total Soluble Solids (%)



Nitrogen concentration in leaves (%)





CONCLUSION

Using the certified organic trade fertilizers in soilless growing did not increasingly influence melon plant vegetative growth and fruit TSS and average fruit weight.

However, fruit yield increase was from 15% to 74% by the organic fertilizers in comparison to the conventional synthetic nutrients.

These results showed that melon plants utilized quite effectively nutrients from the organic fertilizers.



**THANK YOUR FOR
ATTENTION**



RESULTS

The effects of the organic-fertilizers on plant growth parameters of the soilless grown organic melon plants have been investigated at the end of the experiment in June. The differences between the treatments in respect to plant height, leaf number and shoot fresh weight were not statistically significantly (Table 1). Stem diameter only the parameter that was significantly different and the control plants had the thickest stem, the others were similar each other's.



RESULTS

Melon yield was the highest in the Complex fertilised plant and it was 74% higher than control treatment. Second high yield was obtained from the Biofarm fertigated plant and it was 17% higher than the control plants. Third high yield was obtained from the Patrone+Chamlica fertigated plant and it was 15% higher than the control plants. The lowest yield was obtained from the control which was the conventional standard nutrient solution prepared from the synthetic fertilizers.



RESULTS

Complex fertilizer created highest yield, the reason may be due to number of fruit per plant, because the mean fruit weight is not significantly different in the treatments and also Complex fertilizer contained enough amount of micro nutrients for greenhouse melons.



RESULTS

Melon fruit average weight was between 985 g and 1269 g. There was no significant differences among the treatments. Melon fruit total soluble solids -TSS (brix) were between 9.30% and 9.75%. There was no significant differences among the treatments.



RESULTS

In order to investigate leaf nitrogen concentration at the mid period of the experiment leaf samples were taken and analyzed for the nitrogen. Although the nitrogen concentrations were not significantly different, the highest nitrogen content was obtained from the plants which were fed by the Complex organic fertilizer