



One Health
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IMPACT OF BIOSTIMULANTS ON ROOT FORMATION AND DEVELOPMENT IN *ACTINIDIA ARGUTA* CUTTINGS

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Introduction

Actinidia arguta is native to **China, Taiwan, the Russian Far East** and **some regions of Japan**.

The etymology comes from the Greek word '*aktis*', which means '**rays**' and describes **the shape of the flowers**.





Materials and methods

- **The biological material** was represented by cuttings of *Actinidia arguta* plants from the experimental fields within the Faculty of Horticulture.
- **The two propagation benches in the Vegetation House within USAMV Bucharest** were prepared and filled with two rooting substrates: **the first was 50% perlite and 50% zeolite** and **the second was 50% perlite, 25% zeolite 1.2-3 mm and 25% zeolite 0.5-1.25 mm.**





Materials and methods

- The cuttings were **treated** with a **1000 ppm hydroalcoholic solution** (parts of active substance, 1 gram of IBA+ANA powder per 1 liter of water) of **auxins AIB+ANA** (two essential chemical compounds widely used in plant propagation) for **10 seconds**.
- After placing the cuttings on the workbench, a foliar treatment with the **Raiza Mix** stimulator (derived from algae) was started. The treatment was applied by spraying, **twice a week**, for a **period of one month**. The working solution was prepared by diluting 10 ml of Raiza Mix per 10 liters of water.



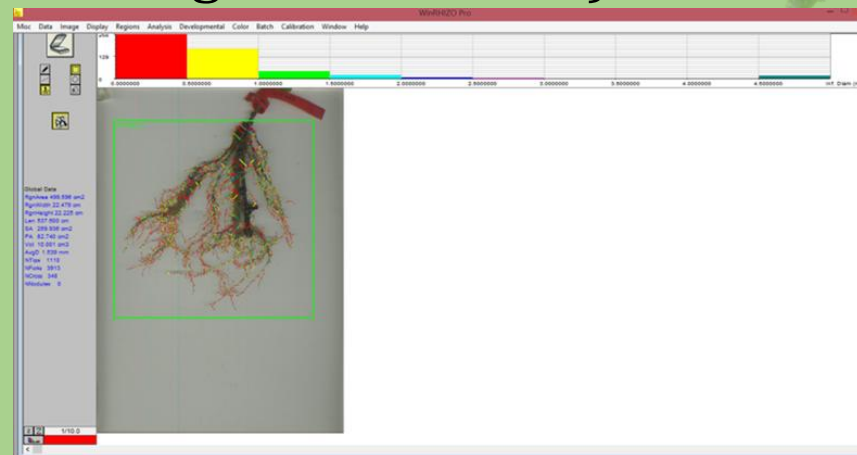


Materials and methods

The root system was analyzed using the **WinRHIZO** program, studying the following aspects:

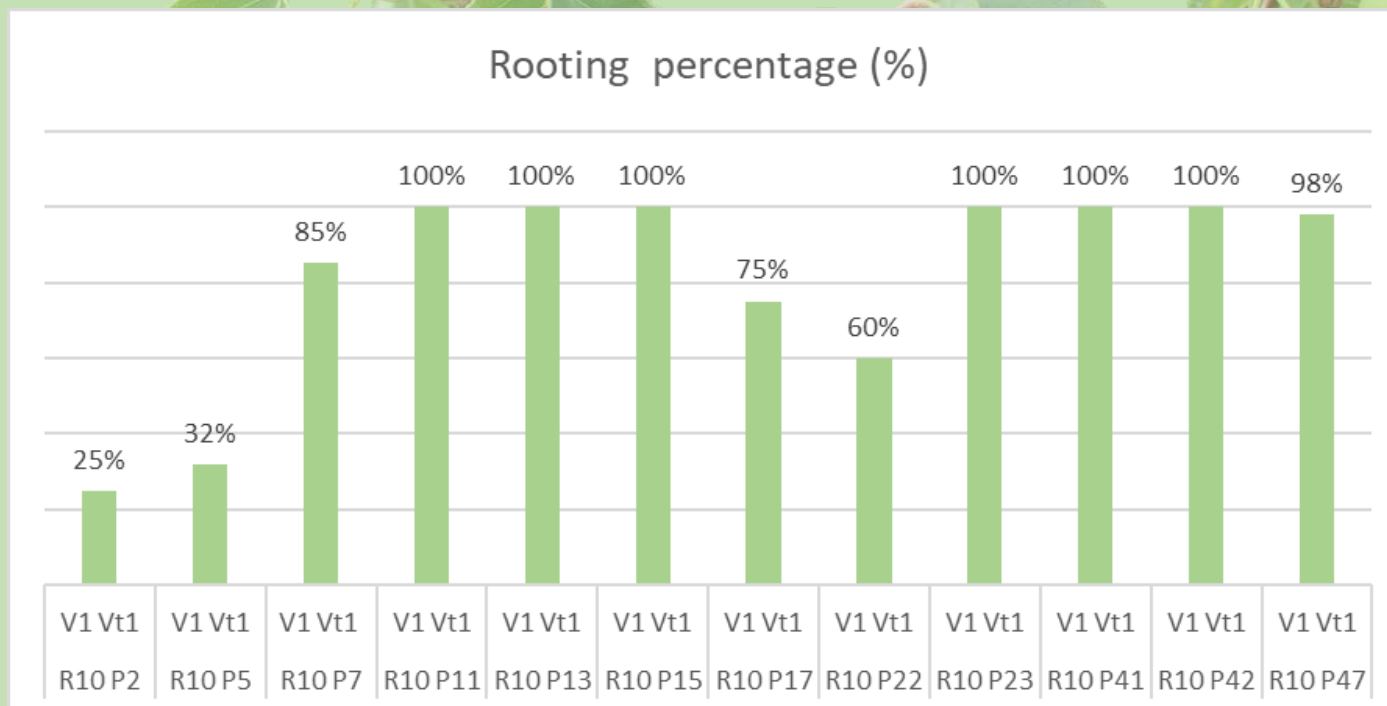
- Root length;
- Root volume;
- Root height.

WinRHIZO is a program that analyzes the root in various ways (volume, height, width, etc.), structure and color.





Results and discussions



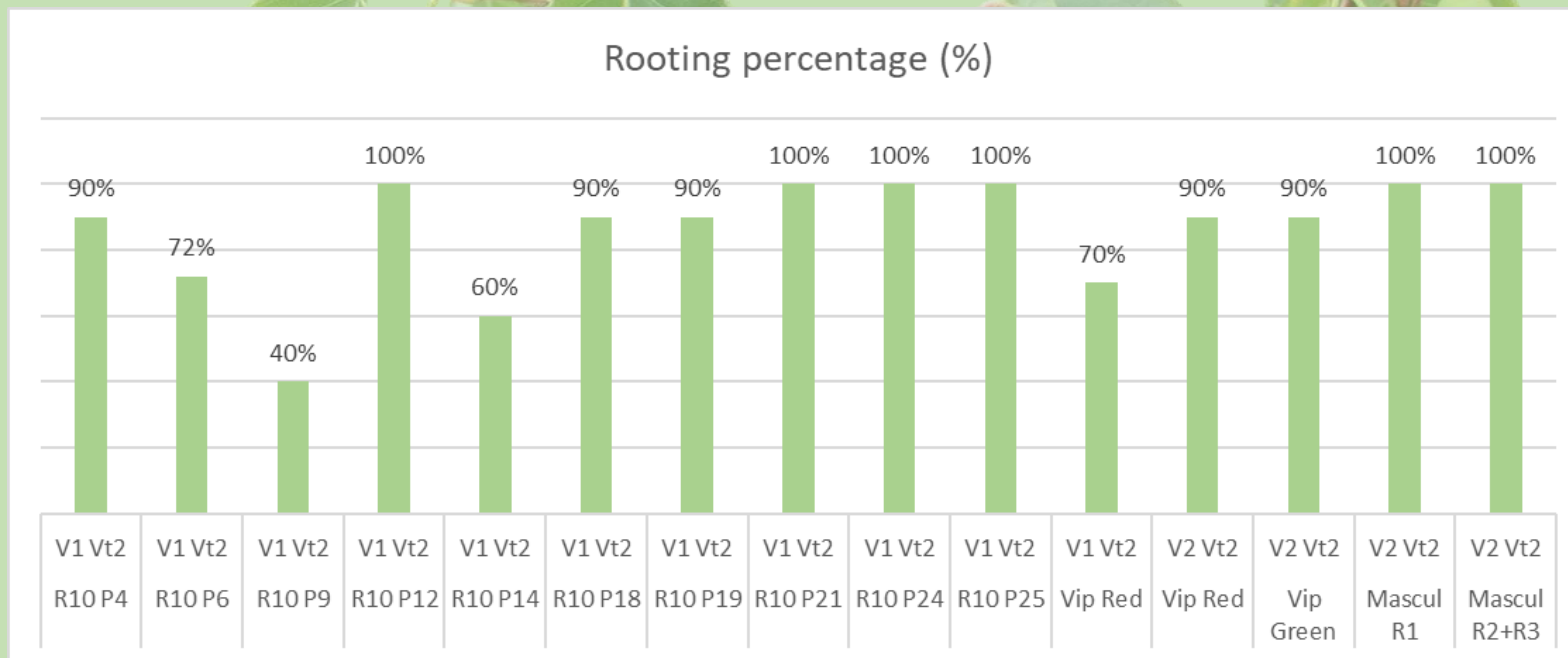
The **lowest rooting percentage** for the **Vt1 treatment** was **25% (R10 P2)** and the **highest** was **100% (R10 P11)**, with a **mean of 90.19%**.

Legend:

- V1 perlite 50% and zeolite 50%
- Vt1- AIB+ANA



Results and discussions



The **lowest rooting percentage** for the **control group** was **60% (R10 P14)** and the **highest** was **100% (Mascul R1)**, with a **mean** of **93.20%**.

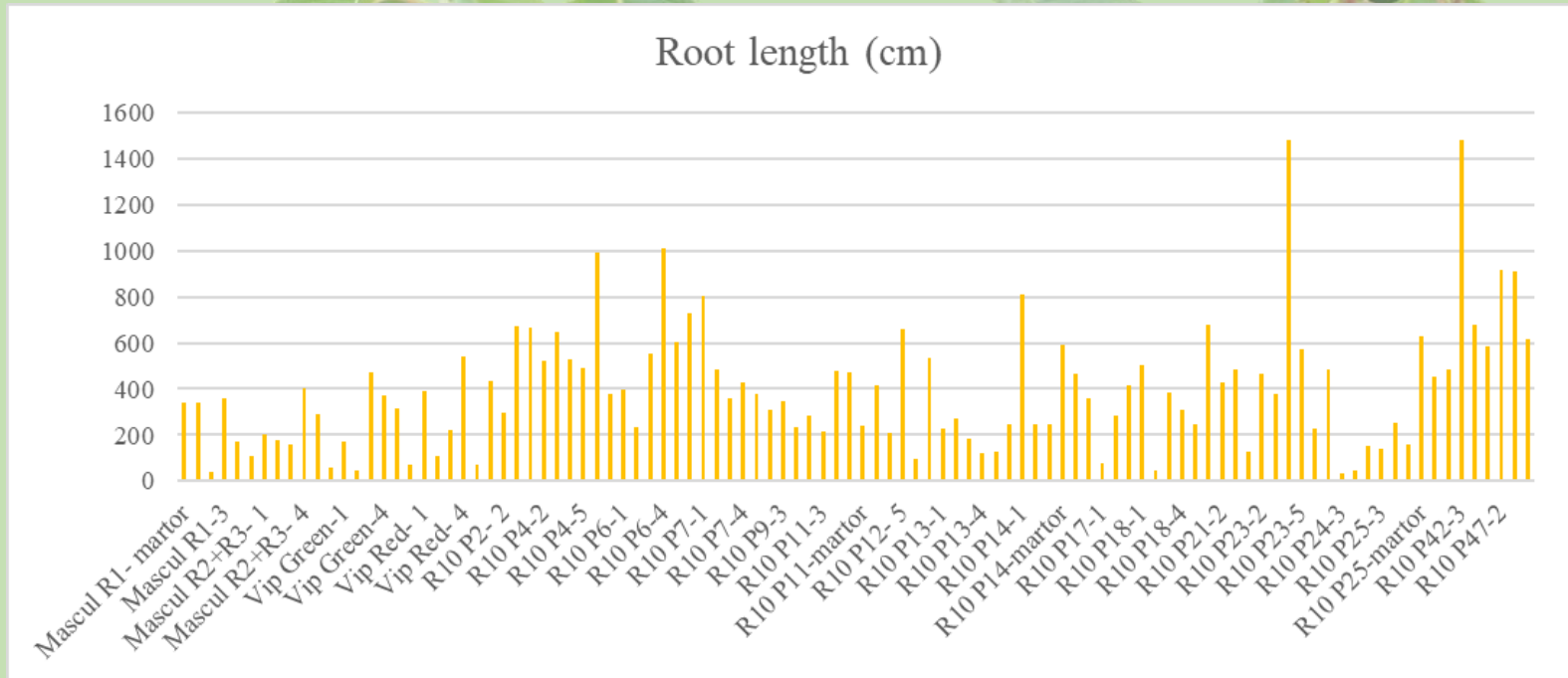
The **lowest rooting percentage** for the **Vt2 treatment** was **40% (R10 P9)** and the **highest** was **100% (Mascul R1)**, with a **mean** of **87.75%**.

Legend:

- V1 perlite 50% and zeolite 50%,
- V2 perlite 50%, zeolite 1.2-3 mm 25% and zeolite 0.5-1.25 mm 25%,
- Vt2- AIB+ANA+Raiza Mix.



Results and discussions



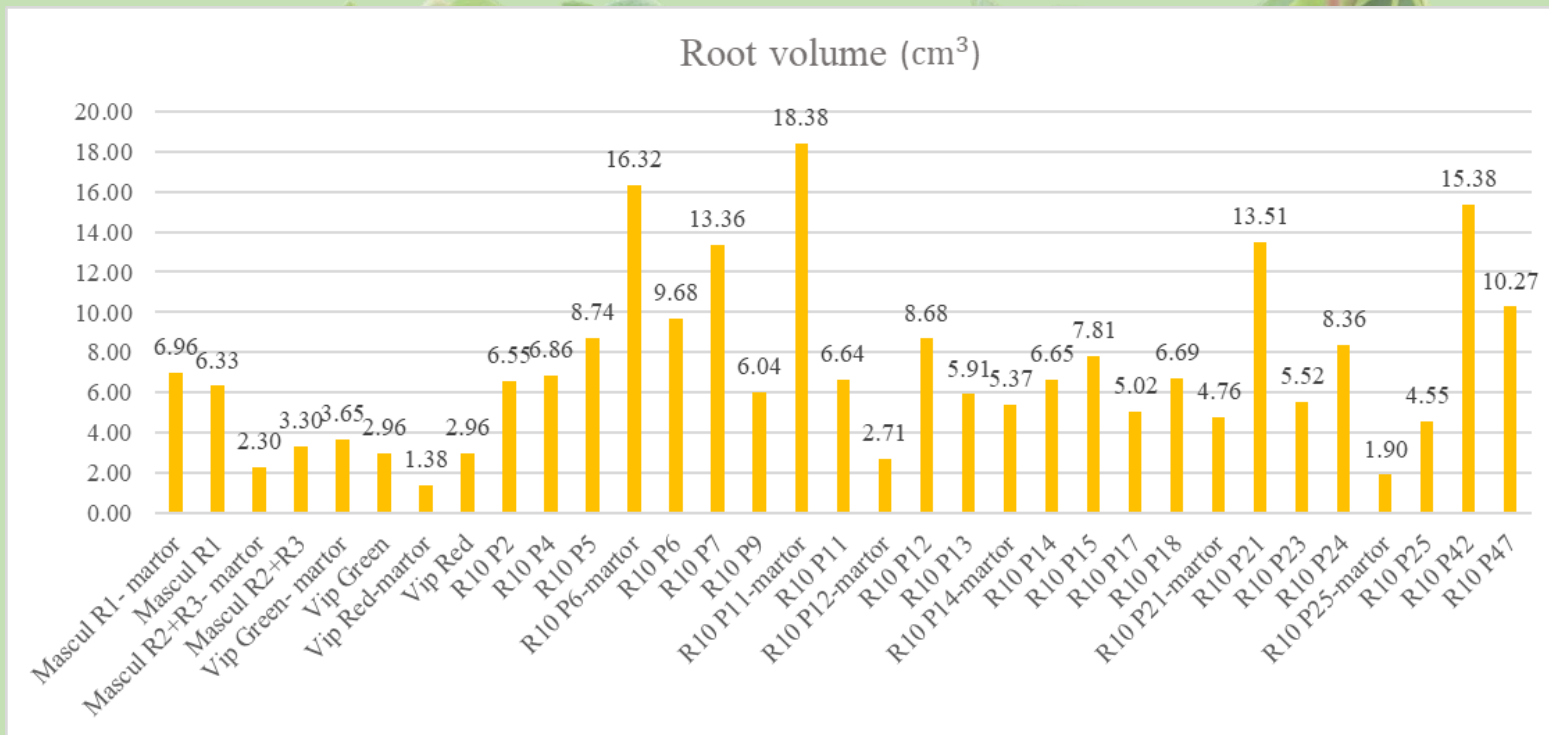
The **lowest value** for the **control root length** was **33 cm (R10 P6-5)**, and the **highest** was **72.6 cm (Vip Red control)** with a **mean** of **20.52 cm**.

The **lowest value** for the **Vt1 root length** was **77.5 cm (R10 P17-2)** and the **highest** was **995.3 cm (R10 P5-1)**, with a **mean** of **445.37 cm**.

The **lowest value** for the **Vt2 root length** was **36.2 cm (R10 P25-1)** and the **highest** was **1012.7 cm (R10 P6-5)**, with a **mean** of **343.13 cm**.



Results and discussions



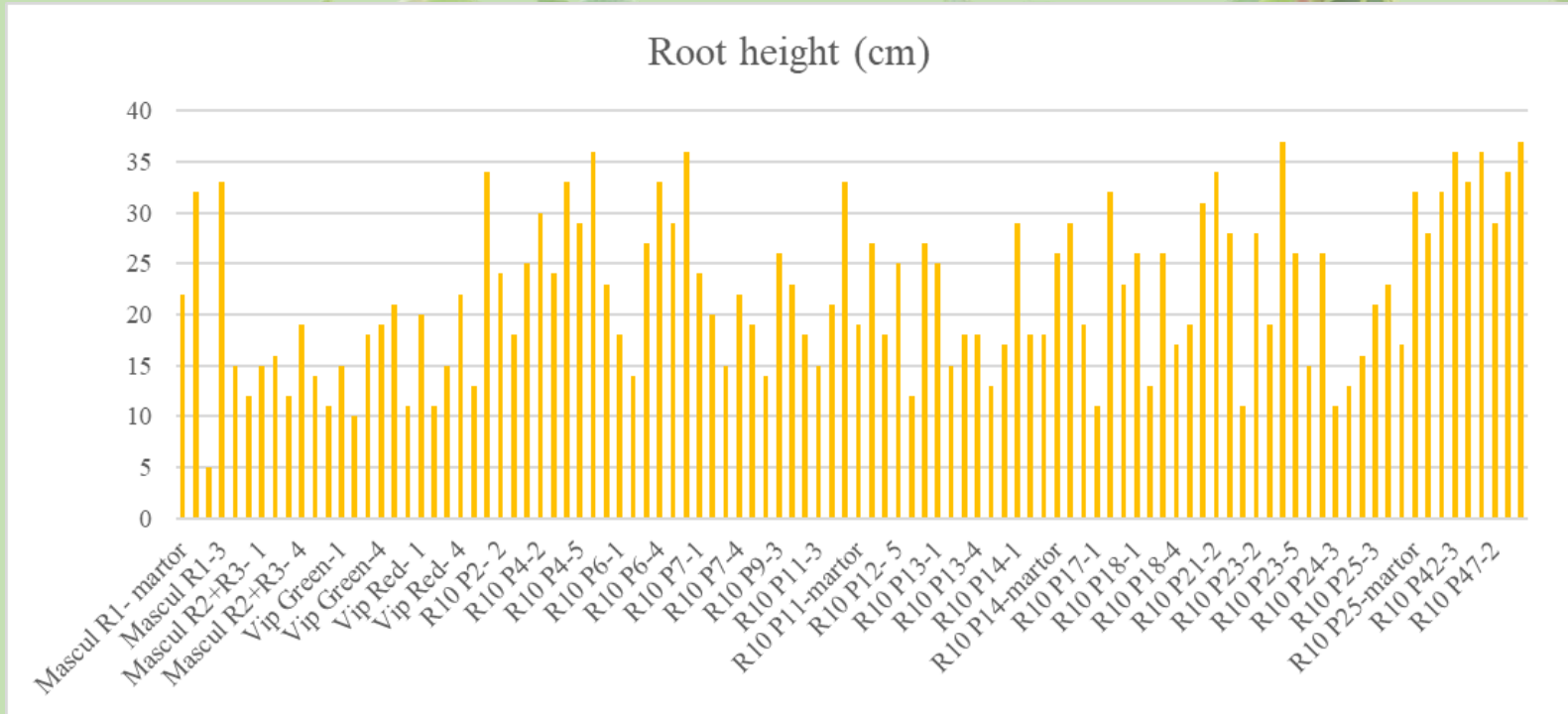
The **lowest value** for the **control root volume** was **1.3 cm³** (Vip Red control) and the **highest** was **18.3 cm³** (R10 P11), with a mean of **6.37 cm³**.

The **lowest value** for the **Vt1 root volume** was **1.9 cm³** (R10 P17) and the **highest** was **23 cm³** (R10 P7), with a mean of **7.56 cm³**.

The **lowest value** for the **Vt2 root volume** was **0.3 cm³** (Vip Green) and the **highest** was **21.2 cm³** (R10 P12), with a mean of **6.19 cm³**.



Results and discussions



The **lowest value** for the control **group's height** was **12 cm (R10 P12-5)** and the **highest** was **33.83 cm (R10 P21-2)**, with a **mean** of **21.52 cm**.

The **lowest value** for the **Vt1 height** was **11.3 cm (R10 P17-2)** and the **highest** was **37.40 cm (R10 P47-5)**, with a **mean** of **25.52 cm**.

The **lowest value** for the **Vt2 height** was **5.3 cm (Mascul R1-3)** and the **highest** was **33 cm (R10 P6-5)**, with a **mean** of **20.52 cm**.



Conclusions

- ❑ The average rooting success rate was highest in the untreated **Control group (93.2%)**. Surprisingly, both **hormone treatments (Vt1 at 90.2% and Vt2 at 87.7%)** slightly reduced the frequency of successful rooting compared to the **Control**. Regarding the **quality of the root system** (evaluated by **height, length, and volume**), the **Vt1 treatment** consistently demonstrated the **best results**.
- ❑ Superior mean values were recorded for **height 25.52 cm, length 445.37 cm, and volume 7.56 cm³** under the **Vt1 treatment**, compared to both the **Control group** and the **Vt2 treatment**.
- ❑ The performance of the **Vt2 treatment** was more **mixed**. Only the mean **root length (343.13 cm)** surpassed the mean value of the **Control group (20.52 cm)**. Opposite, the means for **height (20.52 cm)** and **volume (6.19 cm³)** were below the values recorded by the **Control group 21.52 cm and 6.37 cm³**, respectively).



Recommendations

This **high rate** for the untreated control group suggests that the **V1(perlite 50% and zeolite 50%)** medium propagation conditions in the bench were **excellent for rooting in kiwifruit.**

Treatment (IBA+ANA and Raiza Mix) is the most commonly **recommended** rooting hormone for kiwi.



References

Gledhill, David (2008). *The Names of Plants*. Cambridge University Press. pp. 35, 225. ISBN 978-0-521-86645-3.

Huang, H. (2016). *Kiwifruit: the genus Actinidia*. Academic Press, p. 46.

Thank you for your attention!



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