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PAULOWNIA IMPERIALIS, PRINCESS PAVLOVA'S TREE: DEVELOPING A PLANTATION IN ROMANIA

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Abstract

Paulownia is the fastest-growing tree species in Romania compared to other dendrological species. The development of this species for commercial purposes can be achieved in 4-6 years if certain pedological, agrochemical, and agrotechnical factors are respected, along with specific maintenance work. This study analyzed two hybrid varieties: Paulownia 'Cotevisa 2' and Paulownia 'Superhibrid Z 07'. The establishment and maintenance work, as well as the growth evolution of these varieties, were monitored. The main objective is to obtain data that contribute to the success of Paulownia cultivation in Romania, due to the lack of information regarding the cultivation and maintenance of this plant.

Key words: *paulownia, timber, flowers*

INTRODUCTION

Paulownia cultivation in Romania is a growing agricultural practice, with increasing interest in recent years. *Paulownia* is a tree native to Asia, also known as the "imperial tree" or "porcelain tree". It is characterized by its rapid growth and adaptability to various soil and climatic conditions (Bernardis, 2011).

In Romania, *Paulownia* cultivation is promoted primarily for its valuable timber and its use in the furniture industry. *Paulownia* wood is appreciated for its unique properties, such as lightweightness, strength, and durability. It is also non-toxic and resistant to moisture, making it suitable for various applications. *Paulownia* cultivation in Romania can be carried out in different regions, as the tree adapts to different soil types and climatic conditions. However, attention should be given to soil preparation and proper care to achieve optimal results.

(Zaharia, 2003; Dumitraș, 2003).

Another interesting aspect of *Paulownia* cultivation in Romania is its potential for ecological purposes. Due to its ability to absorb large amounts of carbon dioxide from the atmosphere, *Paulownia* can contribute to reducing greenhouse gas emissions and improving air quality. In conclusion, *Paulownia* cultivation in Romania represents an interesting opportunity for farmers and investors, thanks to the fast growth of the trees, the value of the timber, and its ecological potential. However, further research and consultation with experts are important before initiating such cultivation, as its success depends on various factors, including proper crop management and identifying potential markets for the products obtained (Simion, 2009).

MATERIALS AND METHODS

The study included two hybrids of *Paulownia*: 'Superhibrid Z 07' and 'Cotevisa 2'.varieties within the "*Paulownia* Șipote" plantation. The plantation is located 55 km away from Iași, on a land in the Șipote commune, and is intended for the production of healthy trees that will become an important source of timber and, consequently, profit. The locality of Șipote in Iași county enjoys favorable climatic and soil conditions. In terms of climate, the area is characterized by a temperate-continental climate, with warm summers and cold winters. The average temperatures range from 0°C in January to 25°C in July, with moderate precipitation throughout the year.

The soils in Șipote are generally rich in nutrients and have good drainage. They are mainly brown-reddish soils and chernozems, which are highly fertile and suitable for agriculture. These types of soils provide good water and nutrient retention, which is beneficial for plant development.These climatic and soil conditions

in the locality of Șipote provide a conducive environment for various agricultural activities such as crop cultivation, animal husbandry, and fruit growing. Farmers in the area can benefit from these favorable conditions to obtain abundant and high-quality yields.
This plantation obtained the two analyzed varieties from the following sources:

1. ***Paulownia* Z 07** (**Superhybrid**) is a crossbreed of three species: *Paulownia tomentosa*, *Paulownia fortunei,* and *Paulownia kawakamii.* This hybrid of *Paulownia* is the most popular and preferred in Japan for its fast growth and high-quality wood. It is highly robust, with excellent growth rate, and can adapt to extreme temperature and soil conditions. This species of *Paulownia* is the most resistant to diseases, extreme heat (up to +40°C), drought, and cold (down to -33°C), making it the most frost-resistant among all species (Baier et al., 2021; Szabo et al., 2022).

It is ideal for plantations in Europe, where there are severe extreme temperatures and harsh frosts. In the second year after planting, it can reach a height of 6-8 meters, producing a tall, smooth trunk without knots and of superior quality. It does not have specific requirements for growth conditions. It can thrive in both light and heavy soils, but it grows best in moderately moist, permeable clay soils that are sufficiently fertile. Mature plants, due to their deep root system, are drought-resistant, but in the first year, periodic and abundant watering is necessary.

2. **The 'Cotevisa 2'** hybrid was cultivated in 2003 as a non-invasive hybrid of *Paulownia elongata* and *Paulownia fortunei.* After reaching the required quality, these individuals were reproduced through in vitro vegetative propagation.. *Paulownia* 'Cotevisa 2' was cultivated for semi-arid climatic conditions but is highly adaptable to local climatic conditions. This clone tolerates a temperature range from -25 to +40°C (Lachowicz et al., 2022).

The bifactorial experiments were organized in randomized blocks with three replications (five plants per replication):

- Factor A - genotype, with two variables: a1 - 'Superhibrid Z 07'; a2 - 'Cotevisa 2';
- Factor B - irrigation, with two variables: b1 - non-irrigated; b2 - irrigated. The combination of these factors resulted in four experimental variants: V_1 - 'Superhibrid Z 07' non-irrigated; V_2 - 'Superhibrid Z 07' irrigated; V_3 - 'Cotevisa 2' non-irrigated; V_4 - 'Cotevisa 2' irrigated. During the mentioned period, observations were made for the following parameters: height growth and stem diameter, based on hybrids and water administration. The statistical analysis of the data was performed using the analysis of variance method.

These varieties are often promoted for forestry and agricultural plantations, having several characteristics that make them attractive to farmers or investors in horticulture and forestry. Here are some features and information about them:
a. **Fast growth**: *Paulownia* 'Cotevisa 2' is known for its rapid growth rate, reaching commercial size within a relatively short period, usually between 3 and 4 years, making it attractive for timber production. In contrast, 'Superhibrid Z 07' has a slower growth rate, reaching maturity approximately two years later compared to 'Cotevisa 2'.
b. **Wood quality**: *Paulownia* wood is lightweight yet strong, with low density and good resistance to decay. It is often used in the manufacturing of furniture, panels, musical instruments, and even construction.
c. **Adaptability**: Both varieties are adapted to grow in a variety of climatic and soil conditions, although they prefer locations with sun exposure and well-drained soils.
d. **Disease resistance**: These varieties have been selected for their resistance to diseases and pests, reducing the need for chemical treatments and maintenance.
These determinations will be carried out during the period 2021-2025, and assessments have been made regarding tree growth rate, maintenance work, and agrochemical or insect-pest treatments.
In the second year, a technical cut was applied to all experimental variants, which involved shortening the main stem to 5 cm above ground level. Water administration in the irrigated variants was carried out at intervals of 6-7 days, with quantities of 10-15 liters per plant. Biometric determinations were conducted

throughout the vegetation period, focusing on plant height and stem diameter. The stem diameter was measured at a height of 1 m above ground level. All other maintenance work was performed in all experimental variants.
Statistical data processing was carried out based on variance analysis (limit significance differences, LSD test) (Săulescu et al., 1967).

RESULTS AND DISCUSSIONS

In our measurements, we used 3 trees of each species as control, which means that these trees did not receive proper care compared to the others, but they received the necessary minimum to survive.
It is important to note that these growths are correlated with proper care, including regular irrigation, fertilizer distribution, and soil mulching.
The difference in development between the control trees and the observed ones is significant, so planting them without a proper care plan is not recommended.

Agrotehnical Operations

In a *Paulownia* plantation, there are several agricultural operations necessary to ensure healthy growth and optimal production. These operations include:

1. **Soil preparation**: Before planting, the soil needs to be properly prepared. This may involve tasks such as scarification, plowing, tilling, or leveling the land, removing weeds, and improving soil fertility by applying organic or mineral fertilizers.
2. **Planting seedlings**: *Paulownia* seedlings are usually planted between April and November, depending on local climatic conditions. The seedlings should be healthy, with well developed roots, and should be spaced appropriately based on the desired plantation density.
3. **Irrigation**: In the early stages of development, *Paulownia* seedlings require regular watering to ensure healthy root and stem growth. Irrigation should be sufficient to keep the soil moist but not excessively wet to avoid waterlogging.
4. **Weed control**: Weeds can negatively affect the growth and development of *Paulownia* seedlings by competing for available resources. Soil milling or manual weed removal should be carried out to keep the plantation clean and minimize excessive competition.
5. **Fertilization**: Depending on soil analysis and specific plant requirements, organic or mineral fertilizers can be applied to provide adequate nutrition for *Paulownia* seedlings. This can be done through direct soil application or fertigation.
6. **Pest protection**: *Paulownia* can be affected by various pests, such as slugs, the hairy caterpillar (*Hyphatria cunea*), and the cereal bug (*Eurygaster integriceps*). It is important to monitor the plantation and take preventive or curative measures, such as insecticide treatments, to protect the trees from such issues. (Zaharia & Dumitraş, 2003).
7. **Technical cut**: Technical cut is an important operation for shaping and controlling the development of *Paulownia* trees. Selective pruning of branches and stems can achieve proper form and optimal timber production.

Paulownia cultivation can thrive in a variety of soil types, but there are certain soil characteristics that can favor healthy growth and optimal production. Here are some important considerations regarding soil for *Paulownia* cultivation:

a. **Good drainage**: The soil should have good drainage to avoid excessive water accumulation around the roots. Heavy clay soils or poorly drained soils can cause root problems and negatively impact the growth and development of *Paulownia* trees.
b. **Neutral to slightly acid pH**: The ideal soil for *Paulownia* has a pH between 6 and 8. Soils that are too acidic or too alkaline can affect nutrient absorption and negatively influence the health and growth of the trees.
c. **Moderate fertility**: The soil should be moderately fertile, with adequate nutrient content necessary for healthy growth. Soil analysis is recommended to determine nutrient levels and adjust fertilization accordingly.
d. **Good structure**: The soil should have a good structure that allows roots to develop and spread properly. Heavy clay soils can be improved by adding organic matter to enhance soil structure and drainage. It is important to conduct a soil evaluation before planting and consider the specific needs of *Paulownia* cultivation.

Consulting a soil specialist or agronomist can be helpful in obtaining specific soil advice and taking appropriate measures to improve soil quality if necessary.
The proper planting of *Paulownia* seedlings is a crucial step in developing a healthy and productive crop. Here are some important considerations regarding the planting of *Paulownia* seedlings:

a. **Timing**: *Paulownia* seedlings are usually planted between April and November, depending on local climatic conditions. It is important to choose a time when the risk of frost or extreme temperatures is minimal. (Poșta et al., 2022).

b. **Soil preparation**: The soil should be properly prepared before planting. This may involve tasks such as plowing, tilling, or leveling the land, removing weeds, and improving soil fertility by applying organic or mineral fertilizers. Soil preparation is visible in Figure 1.

Figure 1. Soil preparation

c. **Proper spacing**: It is important to maintain appropriate spacing between seedlings during planting. This may vary depending on the desired plantation density and the species of *Paulownia* being cultivated. Typically, a distance of approximately 3-4 meters between seedlings is recommended.

d. **Planting holes**: Planting holes should be deep and wide enough to allow proper root development. Adding compost or other organic materials to the planting hole is recommended to improve soil fertility and provide additional nutrients to the seedlings.

e. **Careful handling of roots**: Before planting, ensure that the roots of the *Paulownia* seedlings are healthy and well-developed. Handle the roots with care to avoid damage and plant the seedlings in the prepared holes immediately after removing them from the transport container.

f. **Initial watering and care**: After planting, ensure that the *Paulownia* seedlings are well-watered to provide sufficient moisture for them to establish in the soil. Regularly monitor soil moisture and ensure that it remains moist but not saturated with water. Also, protect the seedlings from herbivores and weeds by implementing appropriate protective measures.
It is important to follow specific instructions from the *Paulownia* seedling producer and consider local conditions and specific requirements of the cultivated species. Consulting a *Paulownia* crop specialist or agronomist can be helpful in obtaining advice and specific information for successful *Paulownia* seedling planting.
Proper watering of *Paulownia* seedlings is essential to ensure healthy growth and optimal root development. Here are some important considerations regarding watering *Paulownia* seedlings:

a. **Water quantity**: *Paulownia* seedlings require an adequate amount of water to develop properly. Generally, providing approximately 10-15 liters of water per week for each seedling is recommended. However, the exact amount of water may vary depending on local climatic conditions, soil, and the stage of seedling development. (Baier et al., 2021).

b. **Watering frequency**: It is important to keep the soil around the *Paulownia* seedlings moist but not excessively wet. Regular and consistent watering is usually more effective than heavy watering once a week. Monitor soil moisture and ensure that it remains moist but not waterlogged.

c. **Timing of watering**: In general, it is recommended to water *Paulownia* seedlings early in the morning or late in the evening to minimize water evaporation and allow roots to efficiently absorb water. Avoid watering during the day when temperatures are high and evaporation is greater.

d. **Watering techniques**: There are several watering methods that can be used for *Paulownia* seedlings, such as drip irrigation, sprinkler irrigation, or manual watering with a hose or bucket. Choose the method that works best for you and ensure that water reaches the roots directly (Morenoa et al., 2017).
It is important that water reaches the plants, regardless of the watering method used (Figure 2).

Figure 2. Rustical manual irrigation, with the farm's equipment

Adaptation to local conditions
Consider the specific climate and soil conditions in your area and adjust the watering schedule accordingly. Sandy soils may require more frequent watering, while clay soils may retain water for longer periods. It is important to constantly monitor the condition of the *Paulownia* seedlings and adjust the watering schedule based on their needs. Ensure that the soil remains moist but not excessively wet to avoid root problems and promote healthy seedling growth.

The fertilizer used for *Paulownia* seedlings can play an important role in ensuring adequate nutrition and healthy growth. Here are some important considerations regarding fertilizer for *Paulownia* seedlings (Beckjord et al., 1983; Morenoa et al., 2017):
a. **Soil analysis**: Before applying fertilizer, it is recommended to conduct a soil analysis to determine the level of available nutrients and identify any deficiencies. This can help you choose the appropriate fertilizer and adjust the dosage based on the specific needs of the soil and *Paulownia* seedlings.
b. **Organic fertilizers**: The use of organic fertilizers can be beneficial for *Paulownia* seedlings as they provide essential nutrients and improve long-term soil fertility. Examples of organic fertilizers can include compost, composted manure, or other organic materials.
c. **Mineral fertilizers**: Mineral fertilizers can be used to provide essential nutrients in an easily assimilable form for *Paulownia* seedlings. These may include fertilizers with nitrogen, phosphorus, potassium, and other elements necessary for healthy growth. The dosage and composition of mineral fertilizers may vary based on the specific needs of the soil and manufacturer recommendations.
d. **Application methods**: Fertilizer can be applied in various ways, such as direct soil application around the roots, application in the planting hole, or through fertigation (applying fertilizer through the irrigation system) (Wu et al., 2022). Ensure that you follow the manufacturer's instructions and apply the fertilizer in appropriate doses to avoid over or under-dosage.
e. **Monitoring and adjustment**: It is important to monitor the condition of the *Paulownia* seedlings and observe any signs of nutrient deficiencies or fertilizer excess. Adjust the dosage and frequency of fertilizer application based on the specific needs of the seedlings and their response to the fertilizer. Consulting a plant nutrition specialist or agronomist can be helpful in obtaining specific advice and appropriate recommendations for *Paulownia* seedling fertilization, considering local conditions and specific crop requirements.

Weed control in *Paulownia* seedlings is essential to ensure healthy growth and optimal development. Weeds can compete with the seedlings for available resources such as water, light, and nutrients, and can negatively impact their growth and development. Here are some important considerations regarding weed control in *Paulownia* seedlings:

a. **Manual removal**: An effective and environmentally friendly method of weed control is manual removal. This involves removing weeds by pulling or cutting them by hand. It is important to remove weeds before they produce seeds and spread further.
b. **Use of mulch**: Applying a layer of mulch around the *Paulownia* seedlings can help suppress weed growth. Mulch can be made from organic materials such as straw, wood chips, or dried leaves. This layer of mulch will prevent light from reaching the weeds and reduce competition for resources (Beckjord et al., 1985).
c. **Use of herbicides**: In the case of severe weed infestation, the use of herbicides may be an option. It is important to use herbicides responsibly and follow the manufacturer's instructions. Consult a weed control specialist or agronomist for specific recommendations and to ensure the correct and safe use of herbicides.
d**. Competition through plant density**: Another weed control strategy is to plant *Paulownia* seedlings at a higher density. By filling the available space with seedlings, weed growth space can be reduced, and excessive competition between them can be avoided. It is important to pay attention to weed control in the early stages of *Paulownia* seedling development, as it can significantly influence the success of the crop. Constantly monitor the plantation and take preventive or curative measures to effectively control weeds.
Consult a weed control specialist or agronomist for specific advice and appropriate recommend-dations for weed control in *Paulownia* seedlings, considering local conditions and specific crop requirements.

Technical cutting in *Paulownia* is an essential aspect of care and management in this crop. This practice aims to shape and control tree development to achieve healthy growth, proper form, and optimal timber production. One of the main objectives of technical cutting is to ensure proper branching of the trees. By cutting the shoots that appear in the leaf axils, the development of the stem is encouraged, and height and form are controlled. This contributes to achieving well-developed trees with a dense and uniform crown. Technical cutting is usually carried out during the vegetative dormancy period, before active growth of the trees begins in spring.
It is recommended to remove dry, damaged, or diseased branches to prevent the spread of diseases and maintain overall tree health. Additionally, technical cutting can be used to control plant density in the plantation. By selectively removing some seedlings, adequate growth space can be ensured for each tree, avoiding excessive competition for available resources. This practice is particularly recommended for plantations aimed at producing firewood.
Consulting a specialist in the field can be very helpful in performing correct and efficient technical cutting. In conclusion, technical cutting in *Paulownia* is an essential practice for achieving healthy growth, proper form, and optimal timber production. By correctly applying technical cutting, the success and profitability of *Paulownia* cultivation can be ensured.
Technical cutting is visible in Figure 3.

Figure 3. *Paulownia* technical cutting

These are just a few of the agrotechnical operations necessary in a *Paulownia* plantation. It is important to adapt the practices to the specific conditions of the soil and local climate and consult experts in the field to achieve optimal results.
Exceptional achievements visible in Figure 4 and Figure 5.

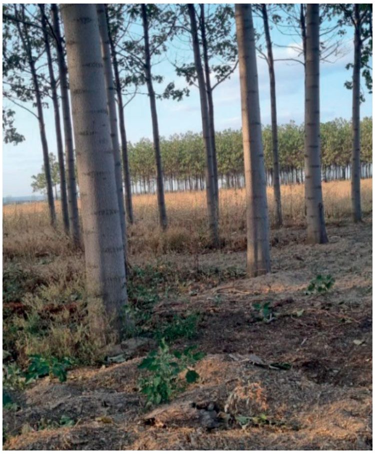

Figure 4. *Paulownia* plantation in Romania

Figure 5. *Paulownia* timber/lumber

The results obtained during the experimental period have highlighted differences between variants, determined by genotype and water administration. To quantify the extent to which the experimental factors influenced the height and diameter growth of *Paulownia* plants, both the cumulative and separate influences of the experimental factors were analyzed (Humenik et al., (2023). The evaluated biometric data represent the growth increments in height and diameter recorded in the autumn of 2023 for the shoots received in the spring of 2022, at 5 cm above ground level (Rad et al., 2015). The growth increment in height over the two years under the cumulative influence of the experimental factors (Table 1) indicates highly significant, positive differences in the irrigated variants. However, the exceedances compared to the control are within a wide range, ranging from 116.43% to 163.62%, with the highest values corresponding to the 'Cotevisa 2' hybrid (V_4). The non-irrigated variants (V_1 and V_3) had growth increments below the control level, with a decrease of 14.55 % for the 'Z07' hybrid and 110.90 % for the 'Cotevisa 2' hybrid.

Table 1. Cumulative influence of experimental factors on height growth

Variants	Height (cm)	% from $\bar{x}$	Diff. from $\bar{x}$	Signif.
V_1	239.00	52.70	-214.50	000
V_2	528.00	116.43	74.5	xxx
V_3	305.00	67.25	-148.5	000
V_4	742.00	163.62	288.5	xxx
Average ($\bar{x}$)	**453.5**	**100**	**-**	**control**
LSD 5%= 3.50; LSD 1% = 5.20; LSD 0.1% = 8.40				

Similarly, in the case of stem diameter, with values ranging from 7.10 to 19.20 cm, the cumulative influence of the experimental factors in the years 2022 and 2023 (Table 2) resulted in highly significant differences compared to the control group. Positive differences were observed in the irrigated variants (V_2, V_4), while negative differences were observed in the non-irrigated variants (V_1, V_3). The maximum diameter (19.2 cm) was recorded in the stems of the irrigated 'Cotevisa 2' hybrid.

Table 2. Cumulative influence of experimental factors on diameter growth.

Variants	Diameter (cm)	% from $\bar{x}$	Diff. from $\bar{x}$	Signif.
V_1	7.10	57.46	-5.30	000
V_2	14.20	114.72	1.80	xxx
V_3	9.00	72.88	-3.40	000
V_4	19.20	154.94	6.80	xxx
Average ($\bar{x}$)	**12.40**	**100**	**-**	**control**
LSD 5% =0.20; LSD 1% = 0.30; LSD 0.1% = 0.50				

To determine the separate influence of each experimental factor, the variants were grouped based on the factor being analyzed. Thus, the influence of genotype was evaluated by comparing the results obtained for each hybrid in both the irrigated and non-irrigated variants, resulting in two groups: Group I (V_1 and V_3) and Group II (V_2 and V_4). From Table 3, it can be observed that genotype strongly influenced the height growth capacity of the plants, with a positive effect determined by the 'Cotevisa 2' hybrid (V_2+V_4), but a negative effect of the 'Superhibrid 'Z07' hybrid.

Table 3. Influence of genotype on height growth.

Variants	Height (cm.)	% from x̄	Diff. from x̄	Signif.
V_I (V_1+V_3)	383.50	84.56	-70.00	000
V_{II} (V_2+V_4)	523.50	115.44	70.00	xxx
Average (x̄)	**453.50**	**100**	-	**control**
LSD 5% =6.60; LSD 1% = 15.20; LSD 0.1% = 48.30				

Genotype had a similar effect on stem diameter as well (Table 4), with larger diameter observed in the 'Cotevisa 2' hybrid and smaller diameter in the 'Z07' hybrid.
However, unlike height growth, the influence was relatively smaller, with the differences compared to the control being significantly distinct.

Table 4. Influence of genotype on stem diameter growth.

Variants	Diameter (cm.)	% from x̄	Diff. from x̄	Signif.
V_I (V_1+V_3)	10.70	86.29	-1.70	00
V_{II} (V_2+V_4)	14.10	113.71	1.70	xx
Average (x̄)	**12.40**	**100**	-	**control**
LSD 5% = 0.40; LSD 1% = 0.90; LSD 0.1% = 2.80				

The influence of the second experimental factor (irrigation) involved grouping the non-irrigated variants (V_1 and V_3) and the irrigated variants (V_2 and V_4), regardless of genotype. Both height growth and stem diameter indicate statistically significant differences compared to the control group (highly significant).
The height of plants in the irrigated variants recorded an average of 635,00 cm, which is 40% higher than the control value, compared to the non-irrigated plants, which did not exceed 300,00 cm (272 cm) (Table 5) (Ptach et al., 2017).

Table 5. Influence of irrigation on height growth

Variants	Height (cm.)	% from x̄	Diff. from x̄	Signif.
V_I (V_1+V_3)	272.00	59.98	-181.50	000
V_{II} (V_2+V_4)	635.00	140.02	181.50	xxx
Average (x̄)	**453.50**	**100**	-	**control**
LSD 5% =2.50; LSD 1% = 5.70; LSD 0.1% = 18.20				

The growth increment in diameter and height of the *Paulownia* hybrids was also studied for each of the three analyzed years. While the growth increment in height showed large variations from one year to another (Figure 6), the diameter remained within close values, especially in the irrigated variants of both hybrids (Figure 7).

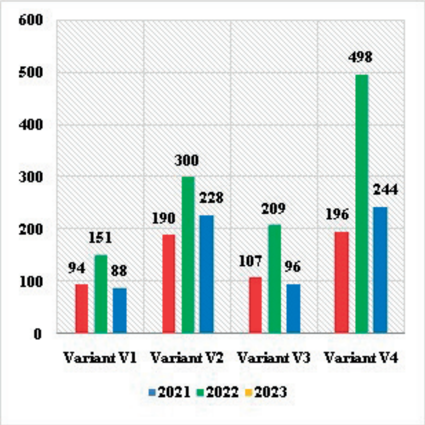

Figure 6. Growth increment in stem height (cm).

Similarly, in the case of stem diameter (Table 6), it was observed that irrigation led to a doubling of the stem diameter compared to the non-irrigated variants.

Table 6. Influence of irrigation on diameter growth

Variants	Diameter (cm.)	% from x̄	Diff. from x̄	Signif.
V_I (V_1+V_3)	8.10	65.32	-4.30	000
V_{II} (V_2+V_4)	16.70	134.68	4.30	xxx
Average (x̄)	**12.40**	**100**	-	**control**
LSD 5% = 0.10; LSD 1% = 0.30; LSD 0.1% = 1.10				

It should be mentioned that the values corresponding to the year 2021 represent the growth of the main stem in the first year from the cuttings used to establish the experimental crops. These stems were shortened to 5 cm in the spring of 2022. Therefore, for the years 2022 and 2023, the values correspond to the directed shoot as the main stem after the technical cut. It is evident that the maximum growth increments in height are achieved by the new shoot, resulting from the technical cut in the second year of experimentation (2022).

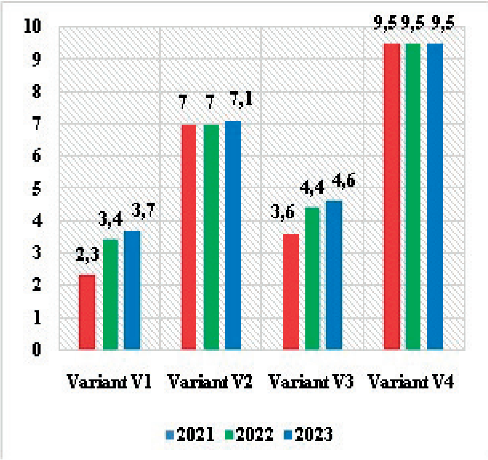

Figure 7. Growth increment in stem diameter (cm)

CONCLUSIONS

Based on the recorded and analyzed data, the following conclusions were drawn at the end of the preliminary analysis period:

1. A very good growth percentage was achieved in the 'Cotevisa 2' variety, showing an increase of over 20% compared to the Superhibrid Z 07 variety.
2. The use of irrigation systems in both varieties resulted in a 200% increase in annual development. Additionally, it was observed that the plants were not affected by phytosanitary diseases. The final success of the crop will depend on how all aspects related to plant care are applied and managed.
3. Stem height was the characteristic that showed the largest differences compared to the control group.
4. The application of technical cut to the main stem in the second year of vegetation resulted in greater vigor of the new shoots, with significant growth in height and diameter.
5. In terms of growth yield in height and diameter of the stems, irrigation is recommended for *Paulownia* crops, with better results observed in the 'Cotevisa 2' hybrid.

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