

## RESERCH ON THE EFFECT OF MULCHING AND WEEDING ON ROBINIA VISCOSA SEEDLINGS IN THE NURSERY

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### RESEARCH ARTICLE

#### Abstract

*In the nursery, weed control is an important maintenance job, which ensures optimal growth and development of the seedlings.*

*Weed control is done from the stage of land preparing for planting.*

*In newly established crops, fighting weeds is very important because they have a high growth power and competes with the seedlings growth that are just forming their root system for nutrients and water.*

*Herbicide is done very carefully so that the seedlings are not affected and is applied with special equipments.*

*Mulching seedlings reduces the appearance of weeds, improves soil texture, maintains soil moisture and has a positive effect on the soil temperature regime.*

**Keywords:** Robina Viscosa, mulch, herbicides, seedlings

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#### INTRODUCTION

An essential role in landscaping is played by woody vegetation, flowers, the way they are arranged exerting influence on climatic factors, determining the appearance of improved microclimates, with higher atmospheric humidity, with reduced solar radiation intensities.

Woody vegetation has an active role in noise reduction. Compact shrub plantations reduce noise by up to 50% from the initial value (Roisin, 1975).

The aesthetic importance of ornamental arboriculture resides in the fact that, in addition to the numerous influences and services rendered to man, it ensures optimal visual comfort, influences the surrounding environment, achieving maximum values in human environments with the help of woody vegetation (Zaharia, D., 2003).

The production of ornamental planting material includes several distinct stages: propagation, seedling formation and plant utilization.

Mulching measures can effectively increase rainfall infiltration and reduce evaporation, thus improving soil moisture status. (Jianpeng M., Xing W., Xining Z. Lu T., Youke W., 2021).

The genus Robinia L. (Papilionoideae, Fabaceae) comprises approx. 20 species originating from Central and North America and belongs to the tribe Robinieae (Benth.) Hutch. (Konarska A., 2019)

Robinia viscosa originates from North America, from the south-eastern lands and is cultivated in Romania as an ornamental species in parks or along alleys.

Robinia viscosa var. hartwigii (Hartweg's locust) is an ornamental tree with high apicultural value and it can be planted in urban greenery and in degraded areas. (Konarska A., and Lotocka B., 2020)

#### MATERIAL AND METHOD

The research objectives aim to determine the growth and development of Robinia Viscosa seedlings under the influence of mulching and herbicide. Straw, chopped bark and sawdust were used for mulching, with the non-mulched version as a control, and two herbicides Reglan (10 ml Reglan + 0.5 l water) and Roundup (20 ml Roundup + 0.5 l water) were used for weed control. with the non-herbicided version as a control.

Before applying the working variant, measurements were made related to the height of the saplings, the number of leaves and the

number of weeds that appear around the saplings.

After installing the variants and completing a vegetation period, measurements were made regarding the height of the saplings, the number of leaves and the number of weeds.

According to the data obtained emerges the most advantageous method of weed control that helps the growth and development of Robinia Viscosa seedlings.

Experimental variants

V1 - Mulching with straw

V2 - Mulching with chopped bark

V3 - Mulching with sawdust

V4 - Unmulched

V5 - Herbicided with Reglone

V6 - Herbicided with Roundup

V7 - Nonherbicided

## RESULTS AND DISCUSSIONS

We can see the growth of Robinia Viscosa plants after a period of vegetation has passed in

table no. 1. It can be said that the seedlings mulched with straw, with chopped bark, with sawdust, the variants (V1-V3) develop better in height than the plants that were herbicided, the values oscillating between 31-30 cm, but the saplings where we used herbicides (V5-V6) look better than the saplings where neither herbicide nor mulch was used.

The statistical analysis of the data reveals that in the variants where we used mulching, the excess compared to the control V4 is very significant, being 63% in variant 2 (bark mulching) and 53 and 58% in V1 and V3 (straw and mulching with sawdust). In the variants treated with herbicide, the exceedances compared to the V7 control are distinctly significant, being 33% in V5 (Reglone treatment) and 19% in V6 (Roundup treatment).

Table 1

The growth of Robinia Viscosa plants under the influence of mulching and herbicides

Variant	Plant growth		+/- D	The meaning of difference	
	Height at performing mulching and of herbicide (cm)	The height after a period of vegetation from the performance of the works			
		Absolute (cm)	Relative (%)		
V1 - Mulching with straw	7	30	158	11	xxx
V2 - Mulching with chopped bark	8	31	163	12	xxx
V3 - Mulching with sawdust	6	29	153	10	xxx
V4 - Unmulched	8	19	100	-	-
V5 - Herbicided with Reglone	10	28	133	7	xx
V6 - Herbicided with Roundup	7	25	119	4	xx
V7 - Nonherbicided	9	21	100	-	-

Dl<sub>5%</sub>=3,4

Dl<sub>1%</sub>=5,1

Dl<sub>0,1%</sub>=7,7

Regarding the number of leaves (whole leaves) on the shoots (table 2), the results obtained show that the plants where we used the herbicide Roundup (V6) have the highest number of leaves (26) with 9 more than V5 where we used the herbicide Reglone.

In the Robinia Viscosa seedlings where we applied mulching, the best results were obtained at V2 with chopped bark, the number of leaves being 19, followed by the other two options mulching with straw and sawdust.

In all cases and where we applied herbicides and where we applied mulch, the seedlings developed better than the control. The significance of the difference from the control in terms of the number of leaves is distinctly significant at V2 (shredded bark mulching) and very distinctly significant at V6 (Roundup herbicide), at V1 (straw mulching), V3 (sawdust mulching) and V5 (herbicide with Reglone) the difference from the control is significant.

Table 2

**The number of leaves under the influence of mulching and herbicide in Robinia Viscosa**

Variant	Number of leaves		+/- D	The meaning of the difference	
	Number of leaves (whole) when performing mulching and weeding (pieces)	Number of leaves (whole) after a vegetation period since the works were carried out			
		Absolute (pieces)			Relative (%)
V1 – Mulching with straw	5	18	113	2	x
V2 – Mulching with chopped bark	3	19	119	3	xx
V3 – Mulching with sawdust	2	18	113	2	x
V4 – Unmulched	3	16	100	-	-
V5 – Herbicided with Reglone	6	17	113	2	x
V6 – Herbicided with Roundup	7	26	173	11	xxx
V7 – Nonherbicided	3	15	100	-	-

DI<sub>5%</sub>=1,8      DI<sub>1%</sub>=2,8      DI<sub>0,1%</sub>=4,4

Regarding the number of leaflets, the data obtained are presented in table no. 3, it can be said that the seedlings where we applied mulch have the highest number of leaflets, 5 pieces and 12 more, respectively, compared to the variants herbicided with Reglone and Roundup. The seedlings where we used mulch with chopped bark, mulch with sawdust develop better (they had more leaflets) than the seedlings where we used mulch with straw.

Statistical analysis of the difference to the control indicates a highly significant

difference at V5 (herbicide with Reglone), distinctly significant at V2; V3; V6 and significant at V1. The expression in percentages shows an excess of 15% for variant 5 compared to the control and 5-8% for the other variants compared to the control.

Table 3

**The influence of mulching and weeding on the growth of Robinia Viscosa plants**

Variant	Plant growth		+/- D	The meaning of the difference	
	Number of leaves (after the leaf) to performing mulching and weeding (pieces)	Number of leaves (per leaf) after a vegetation period from performing the works			
		Absolute (pieces)			Relative (%)
V1 – Mulching with straw	20	109	105	5	x
V2 – Mulching with chopped bark	14	112	108	8	xx
V3 – Mulching with sawdust	8	111	107	7	xx
V4 – Unmulched	26	104	100	-	-
V5 – Herbicided with Reglone	24	107	115	14	xxx
V6 – Herbicided with Roundup	20	100	108	7	xx
V7 – Nonherbicided	18	93	100	-	-

DI<sub>5%</sub>=3,1      DI<sub>1%</sub>=4,9      DI<sub>0,1%</sub>=7,9

The data obtained are in table 4 (by number of weeds). Analyzing the data obtained, it can be said that where we applied the herbicide Reglone and Roundup V5 and V6, the weeds develop more slowly than in the plants where we applied sawdust and straw mulch.

The best results among all the variants were obtained at V2 mulching with chopped bark, where the number of weeds was the lowest, but all methods of mulching and herbicides give better results than where neither mulching nor herbicides were used (control). The significance of the difference from the control is distinctly significant

negative at V2 and V5 and significant negative at V1,V3, V6.

Table 4

Variant	Number of weeds			+/- D	The meaning of the difference
	Number of weeds at performing mulching and of herbicide (pieces/m <sup>2</sup> )	Number of weeds after a growing season			
		Absolute (pieces/m <sup>2</sup> )	Relative (%)		
V1 - Mulching with straw	0	11	31	- 24	x
V2 - Mulching with chopped bark	0	4	11	- 31	xx
V3 - Mulching with sawdust	0	15	43	- 20	x
V4 - Unmulched	3	35	100	-	-
V5 - Herbicided with Reglone	0	2	3	- 29	xx
V6 - Herbicided with Roundup	1	4	13	- 27	x
V7 - Nonherbicided	4	31	100	-	-

D<sub>5%</sub>=17,2      D<sub>1%</sub>=25,6      D<sub>0,1%</sub>=38,2

### CONCLUSIONS

The highest increases in *Robinia Viscosa* seedlings were recorded in the variants where we used mulching (V1, V2, V3). The best results for the herbicided variants were recorded for Variant V5 (herbicided with Reglone).

The highest number of whole leaves was recorded in the seedlings of *Robinia Viscosa* where we herbicided with Roundup (V6). It can be seen that the seedlings developed more slowly in terms of the number of whole leaves in the variants where we used mulching with straw (V1), with sawdust (V3) and where I used Reglone (V5), than in the variants where I used mulching with bark.

The number of leaflets developed best in the *Robinia Viscosa* seedlings where we applied the herbicide Reglone (V), followed by the seedlings where we applied mulch with chopped bark (V2), sawdust (V3) and the herbicide Roundup (V6). It can be seen that the variant where we used mulching with straw (V1) developed the slowest.

Regarding the number of weeds, the best results were obtained with the V2 variant where we used mulching methods with chopped bark and the V5 variant where we used the Reglone herbicide.

In conclusion, the best method is variant 2 (shredded bark mulching method), followed by V5 (reglone herbicide method), followed by variant V3 (sawdust mulching method) and V1 (mulching method with straw), and the weakest method is represented by the V6 variant (the Roundup herbicide method).

Mulching with chopped bark is the best method as it ensures a perfect covering of the ground around the plant, ensures the

maintenance of higher soil moisture and in this way does not allow the growth of weeds around the plant, thus ensuring a better growth of *Robinia Viscosa*.

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