



# Report on Master's thesis defense, Bulgaria, June 26th 2024





### Project information

Project title	Agroforestry practices in West Balkan for sustainable development: weaknesses and strengths
Project acronym	AGFORWEB
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### Document control sheet

Title of the Work Package	WP3 Development
Title of Deliverable	Report on Master's thesis defense
Institution(s) and Author/s of the deliverable	University of Forestry, Sofia, Bulgaria Krasimira Petkova
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Status of the document	Final



### *PMU meeting*

Wednesday 26 <sup>th</sup> June 2024	
08:15 – 8.30 h	Registration of participants
8.30 – 9.00 h	<b>Master thesis defense - online</b>
09:00 - 10:30 h	Overview of activities and results in WP3 (M. Čurović)
	Overview of activities and results in WP4 (V. Ivezić)
	Quarterly report 6 and action plan in next period (S. Lukić)
	Financial reporting (A. Baumgertel)
	Discussion and closing the meeting
10:30 – 10:40 h	Break

Participants from 5 partner institutions - University of Belgrade Faculty of Forestry, Serbia (UB); University of Montenegro Biotechnical faculty (UOM); University of Forestry from Sofia, Bulgaria (UFS); Josip Juraj Strossmayer University of Osijek Faculty of Agrobiotechnical Sciences (UNIOS) and Croatian Forest Research Institute from Jastrebarsko, Croatia (CFRI) were present at the Master's thesis online defense. Altogether 21 participants were present at the meeting (attendance list is attached below).

The meeting started at 8:30 a.m. with the online defense of a Master's thesis. The candidate was BSc Ljuben Balurov, mentor Assoc. Prof. Krasimira Petkova, master thesis title 'State of the forest protective belts in the region of the town of Nikopol'. The thesis defense was followed online by the participants of the meeting. The defense was held in Sofia before a commission from the Faculty of Forestry of University of Forestry, Sofia.

#### **State of the forest protective belts in the region of the town of Nikopol, Central Bulgaria**

##### Summary

During the period between 1951 - 1963, a network of forest protective belts was established in North-Eastern Bulgaria. At the same time, forest protective belts were established in other regions of Bulgaria, but not in a network. This is the region of the Nikopol State Forest District where the master thesis was carried out. The city of Nikopol is located on the banks of the Danube River in Central Northern Bulgaria (Figure 1).

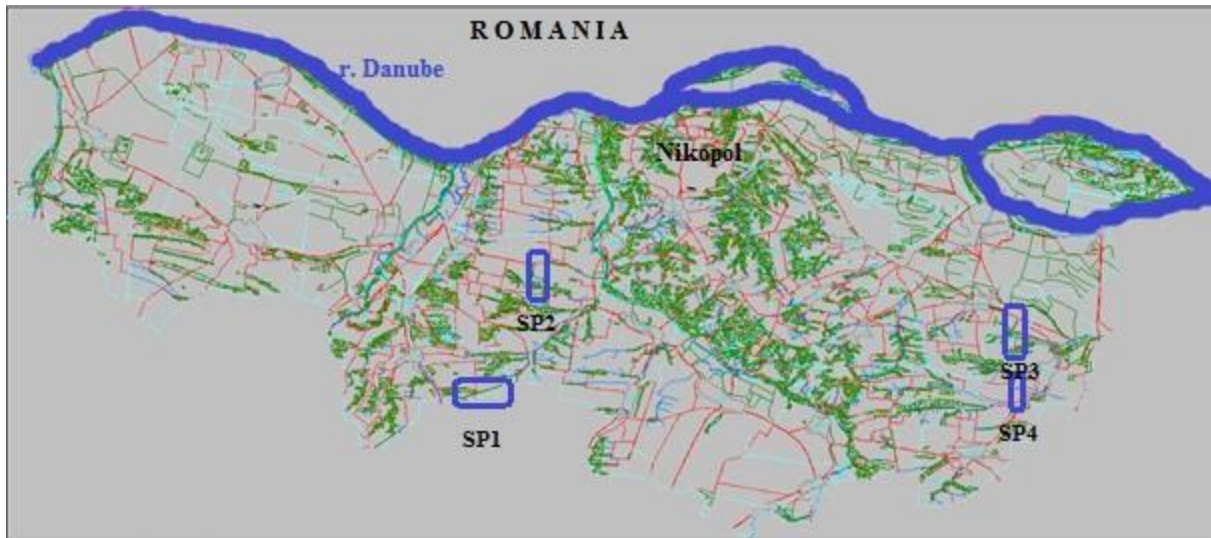


Figure 1. Map of the sample plots (SP) in the study region

The aim of the work is to analyze the state of forest protective belts in the region of the town of Nikopol.

The main objectives of this work were:

- Characteristics of natural conditions in the region of Nikopol
- Assessment of the growth of Honey locust (*Gleditsia triacanthos* L.) in forest protective belts in the region
- Assessment of the effect of the forest protective belts on yields of major agricultural crops.

The region of the town of Nikopol is part of the Danube hilly plain and is characterized by a moderately continental climate with cold winters and hot summers. The openness of the Danube plain creates conditions for the unimpeded invasion of cold air masses from the North and in winter - for snowstorms and blizzards. The winds are strong and with a Northern component. In this climate, the establishment of forest protective belts ensures the improvement of the microclimate and the conditions for growing agricultural crops.

The forest protective belts in the region of the town of Nikopol are mainly from Honey locust. For the subjects of this master thesis, 4 belts were chosen - 3 pure from Honey locust and one mixed with Field ash (*Fraxinus angustifolia* Vahl.). The belts were between 50 and 60 years old. They are situated in rich, dry and slightly moist habitats on leached chernozem with a sandy-clay mechanical composition, on parent material loess, at an altitude of 100 to 150 meters, on sloping to gently sloping terrain. In each belt, a sample plot of 1 decare (1000 m<sup>2</sup>) was established, in which the survival rate was determined, and the diameters at breast height of all trees were measured, and the average diameter at breast height was determined. The average height was also determined. One average model tree was cut down and stem analysis was done. The course of growth in height, diameter and volume was followed. The wood volume was determined.

A relatively low survival rate was found (from 27 to 50%). Probable causes - carrying out unregulated felling and insufficient cultivation care in the first years after afforestation.



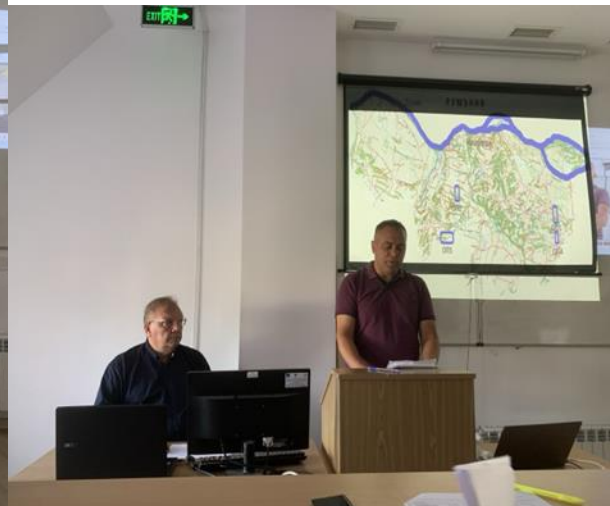
The best growth was characterized by the Honey locust from a belt of rich and slightly moist habitat, where at the age of 52 the average diameter at breast height was 32 cm, stem volume - 376.19 m<sup>3</sup>ha<sup>-1</sup> and average increment in volume 7.23 m<sup>3</sup>ha<sup>-1</sup>.

Corn, wheat and especially sunflower yields were higher in fields protected by forest protective belts. The average increase is about 20-30%.

The examined forest protective belts are in a relatively good health condition. No damage from fungal pathogens or insect pests was observed.

#### Recommendations

1. The Honey locust is a suitable tree species for future forest protective belts in the region of Nikopol.
2. In order to stimulate growth and form straighter stems, the belts should be maintained by carrying out timely silvicultural measures.
3. To establish and maintain a good belt structure, it is recommended not to introduce shrubs.
4. The achieved higher yields of corn, wheat and sunflower in the fields protected by forest protective belts prove their effectiveness and are grounds for establishment new belts in the region.
5. To monitor the condition of the belts, to take continuous care, to keep them in good health and to protect them from fires and illegal encroachments.
6. To conduct informative meetings and familiarize the local population with the beneficial impact of the belts on agricultural crops, to take into account their opinion, suggestions and sympathy for the problems that have arisen





#### ATTENDANCE LIST

No.	Name	Organization
1.	Sara Lukić	University of Belgrade
2.	Ivana Zegnal	Croatian Forest Research Institute
3	Milić Čurović	University of Montenegro
4.	Anton Brenko	Croatian Forest Research Institute
5	Vladimir Margeta	Josip Juraj Strossmayer University of Osijek
6	Jelena Lazarević	University of Montenegro
7.	Ana Topalović	University of Montenegro
8.	Milena Đokić	University of Montenegro
9.	Monika Tkalec Kojić	Josip Juraj Strossmayer University of Osijek
10.	Ljudevit Balić	Josip Juraj Strossmayer University of Osijek
11.	Vladimir Ivezić	Josip Juraj Strossmayer University of Osijek
12.	Teodor Nedelin	University of Forestry, Sofia, Bulgaria
13.	Engin Shukriev	University of Forestry, Sofia, Bulgaria
14.	Orhan Mechmedov	University of Forestry, Sofia, Bulgaria
15.	Jelena Beloica	University of Belgrade
16.	Martin Antonov	University of Forestry, Sofia, Bulgaria
17.	Ivan Kirov	University of Forestry, Sofia, Bulgaria
18.	Krasimira Petkova	University of Forestry, Sofia, Bulgaria
19.	Georgi Kostov	University of Forestry, Sofia, Bulgaria
20.	Aleksandar Baumgertel	University of Belgrade
21.	Nasko Iliev	University of Forestry, Sofia, Bulgaria