



# ANALYSIS OF THE BLACK LOCUST STANDS' BIOMASS PRODUCT IN HUNGARY

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## ABSTRACT

Nowadays, the black locust (*Robinia pseudoacacia*) is the most current and the most widely used tree species in Hungary. Due to its penetration and the wide variety of application it's worth to examine, what kind of assortment their with different origins, and in different environmental conditions growing stands offer.

In our current article we compare the assortment composition of the black locust stands of seedling and coppice origin, and we analyse how the wood use income of the stands of different origins turns out (seed and root sucker).

We provided our research in the area of Nyírerdő Forestry Co. Ltd and SEFAG Forestry and Wood Industry Ltd. During the research we used the final harvest data for the 2010-2017 period..

## INTRODUCTION

Nowadays, the black locust (*Robinia pseudoacacia*) is the most current tree species in Hungary. No country in Europe has as many black locust forests as Hungary. More than 24% of our country's forest area is covered by black locust (Bartha, 2016; National Forest, 2015). The most prominent black locust-producing districts are the Nyírség, Cserhát, hills of Gödöllő, the Bács-Kiskun, Somogy, Vas, Zala county, and the sandy area of the Little Hungarian Plain. Among them, the Nyírség, Bács-Kiskun county and the Northern Part of Somogy have high quality stands.

As the result of the climate change the annual average temperature increases and along with this the forest climate zones are also „migrating”. Generally speaking, the area ratio of beech forest climate decreases and along with this the area of the forest steppe climate grows. This will lead to a change in the tree species composition, that will reduce the area ratio of beech (*Fagus sylvatica*) and the black locust can be emphasised, and the groups of poplar.

Thanks to the deep roots of the black locust, it can live on the sandy, salty areas, ties the loose running sand, and it can be used for the afforestation of the bad quality sandy areas (Járó, 1953; Rédei, 1997).

Its wood has a wide variety of recovery options. Its excellent physical properties and exceptional durability allow it to be widely used in the sawmill, furniture and carpentry industries. It's widely used in the land- and water building, it's durable as a fence post, vine pole and vine stake. The black locust can be used in the production of cellulose, wood-pulp board and chipboard as well. Recently, they also make glued-laminated holders of them. Half the weight of the produced black locust is used for energy purposes, so they make firewood of them (Major, 2016; Molnár, 1996).

Because of its penetration and its widespread use it is worth to examine what assortment the stands of different origins bring, and how they influence the use of the black locust.

## TESTING METHODS

During the research, we sought to answer the question how the assortment composition of black locust stands of different forestry land changes in case of the same origin (seeds sprout, root sucker) and the same genetic soil type. We carried out our examinations in the area of the Nyírerdő Forestry Ltd. and the SEFAG Forestry and Wood Industry Ltd.

Black locust stands occur on 9 different genetic soil types. However, comparison can be made only on two soil types, because only these two occur on both forestry land. In case of „kovárvány” brown forest soil we could compare the seedling-and coppice stands, on humous sand we could compare the root sucker stands.

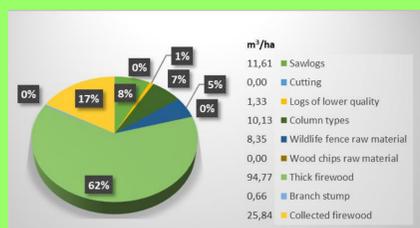
During our research, we used the end use data for the period 2010-2017 (Iski, 2017; Pintér, 2018).

Before starting the research, different filtering was performed on the data. The database contained 5-100% forest parts, only the forest parts with 90% or more black locust mixture ratio were taken in account during the evaluation.

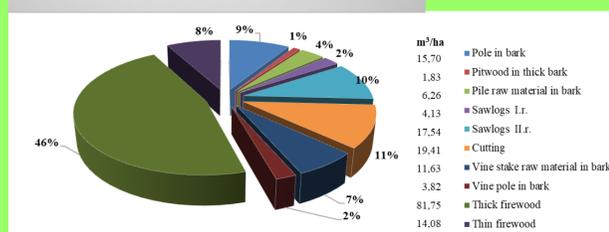
During our research we compared the assortment composition and the timber utilisation income per ha as well. For this, we used the 2017 assortment prices.

## THE COMPARISON OF SEEDLING BLACK LOCUST STANDS ON „KOVÁRVÁNY” BROWN FOREST SOIL

In the case of seedling stands the SEFAG Ltd. produced 152,7 m<sup>3</sup> per ha on „kovárvány” brown forest soil, the Nyírerdő Ltd. 170 m<sup>3</sup>. In the Nyírség 21,67 m<sup>3</sup>/ha were produced from sawlogs, in Somogy only the half of it, so 11,61 m<sup>3</sup>/ha. The cuttings weren't in Somogy converted into assortments, but in the Nyírség the cutting amounts to one-tenth of the total assortment in case of the seedlings. Both thick firewood and collected firewood were produced in Somogy more, approximately 10 m<sup>3</sup>/ha. The Nyírerdő Ltd. has an income of 3,86 million Ft/ha on „kovárvány” brown forest soil, in case of seedlings this amount is 1,26 million Ft more per ha than in case of the SEFAG Ltd. There are only a few from the high quality assortment, which are expensive, in the area of the SEFAG Ltd. but there are more from the cheaper ones, which effects the financial differences.



Assortment composition of seedling stands on „kovárvány” brown forest soil in the area of the SEFAG Ltd.



Assortment composition of seedling stands on „kovárvány” brown forest soil in the area of the Nyírerdő Ltd.

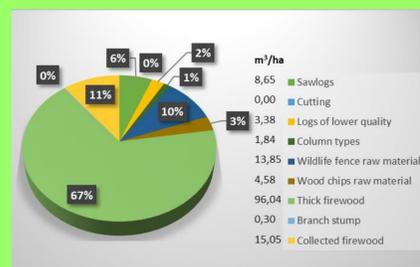
## Assortment composition of seedling stands on „kovárvány” brown forest soil

## Acknowledgements

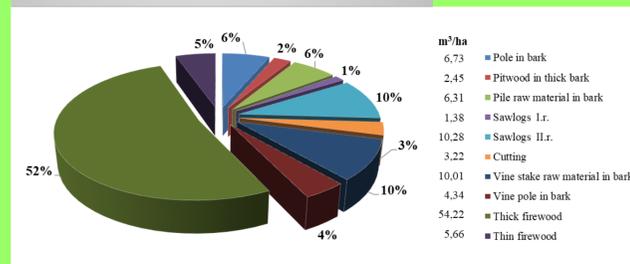
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## THE COMPARISON OF ROOT SUCKER BLACK LOCUST STANDS ON „KOVÁRVÁNY” BROWN FOREST SOIL

In Somogy they produced 143,7 m<sup>3</sup>/ha timber from the root sucker stands on „kovárvány” brown forest soil, while in the Nyírség they produced only 110 m<sup>3</sup>/ha. In case of root sucker stands the Nyírerdő Ltd. produced 2,20 million Ft/ha, while the SEFAG Ltd. produced 2,42 million Ft/ha. Off the three comparisons, this one was the only one, where the produced timber in the area the most valuable was.



Assortment composition of root sucker stands on „kovárvány” brown forest soil in the area of the SEFAG Ltd.

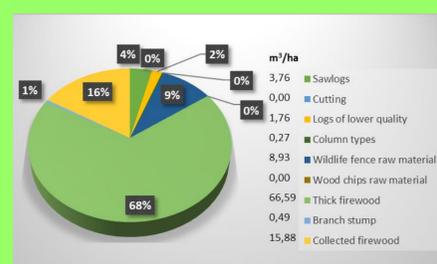


Assortment composition of root sucker stands on „kovárvány” brown forest soil in the area of the Nyírerdő Ltd.

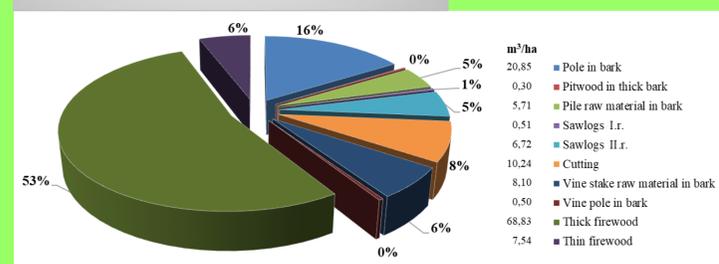
## Assortment composition of root sucker stands on „kovárvány” brown forest soil

## THE COMPARISON OF ROOT SUCKER BLACK LOCUST STANDS ON HUMOUS SAND

On the humous sand soils they exploited much less timber in the areas of Somogy (97,7 m<sup>3</sup>/ha), than in the Nyírség (130 m<sup>3</sup>/ha). As we have seen it in case of the „kovárvány” brown forest soil, the cutting production is really significant in the Nyírség, and on the other hand, they produced more from the sawlogs as well. The two forestries produced almost the same amount of the thick firewood. As we have seen it from the past two comparisons, they produced more from the collected firewood in the area of the SEFAG Ltd. The differences between the assortments show up in the incomes as well. The Nyírerdő produced 2,77 million Ft/ha against the SEFAG Ltd., which produced only 1,56 million Ft/ha from their black locust stands on humous sand.



Assortment composition of root sucker stands on humous sand in the area of the SEFAG Ltd.



Assortment composition of root sucker stands on humous sand in the area of the Nyírerdő Ltd.

## Assortment composition of root sucker black locust stands on humous sand

## SUMMARY

The table summarizes the volume of timber harvested per ha and the timber utilisation income per ha in the area of the two forestries (forestry land).

	Origin	Genetic soil type	SEFAG Ltd.	Nyírerdő Ltd.
Produced timber volume [m <sup>3</sup> /ha]	Seed	„Kovárvány” brown forest soil	152,7	170,0
	Root sucker	„Kovárvány” brown forest soil Humous sand	143,7	110,0
Income [million Ft/ha]	Seed	„Kovárvány” brown forest soil	2,60	3,86
	Root sucker	„Kovárvány” brown forest soil Humous sand	2,42	2,20
			1,56	2,77