

The Mulberry – Initial experiences with a fruit variety with potential for organic cultivation

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Abstract

*In the BOKU experimental garden in Vienna, several mulberry (*Morus* spp.) varieties were cultivated under organic conditions and without pesticides. In 2023 and 2024, selected phenological parameters were described. The results show different flowering and ripening times and fruit characteristics of the varieties. Furthermore, significant differences in response to frost events were observed. Based on yield and fruit quality, 'Illinois Everbearing' and 'Regina', and probably also *M. australis* 'Baranya' have the greatest potential for fresh market applications under the Pannonian climate among the tested varieties. Their performance in terms of yield, frost resistance, and fruit quality makes them suitable candidates for further cultivation and research.*

Keywords: Mulberry, new fruit species, climate change

Introduction

Mulberries (*Morus* spp.), belonging to the *Moraceae* family, are widely distributed globally and thrive in diverse climatic conditions, including tropical and temperate regions. Their drought tolerance and efficient water usage make them particularly suitable for cultivation in the context of climate change. Among the most important species for fruit production are *Morus alba*, *M. nigra*, *M. rubra*, and *M. macroura*, as well as several hybrids. However, their limited transport and storage capabilities restrict their fresh market availability, leading to their use in processed forms like juice, jam, and dried products.

Material and Methods

The study was conducted at the BOKU University research garden in Vienna, under Pannonian climate, characterized by warm, dry summers and moderately cold winters. In 2023 and 2024, sixteen mulberry varieties, including 12 local varieties (primarily *M. alba* from Hungary, all planted in 2019) and four reference varieties (planted from 2014 -2019) were evaluated for their phenological traits, fruit quality, and yield performance using the descriptor of Urbanek Krajnc and Kozmos (2023). The varieties were cultivated organically without the use of fertilizers or pesticides.

Results and Discussion

The varieties exhibited diverse flowering and ripening periods. 'Baranya' had the earliest ripening time in both 2023 and 2024, followed by 'VE 2620' and 'Regina'. In contrast, 'Mojo Berry' ripened the latest. 'Illinois Everbearing', a hybrid from *M. rubra* x *M. alba* and *M. australis* 'Baranya' showed no significant frost damage in both years. 'Regina' experienced severe late frost damage in 2024 but still managed to produce high yields (Fig. 1). Other varieties, such as 'Mojo Berry', 'BA 2229', and 'VE 2373', were more susceptible to frost damage. Most varieties exhibited upright growth, while 'Illinois Everbearing', 'Mojo Berry', and 'Regina' had semi-upright growth. 'Illinois Everbearing' and *M. australis* 'Baranya' consistently delivered very high yields (rating >8 on a scale from 1 to 9) across both years.

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'Regina' also performed well in 2024 despite frost damage. 'Mojo Berry' and 'VE 2620' showed medium to high yields, while other varieties had lower productivity (Fig. 1).

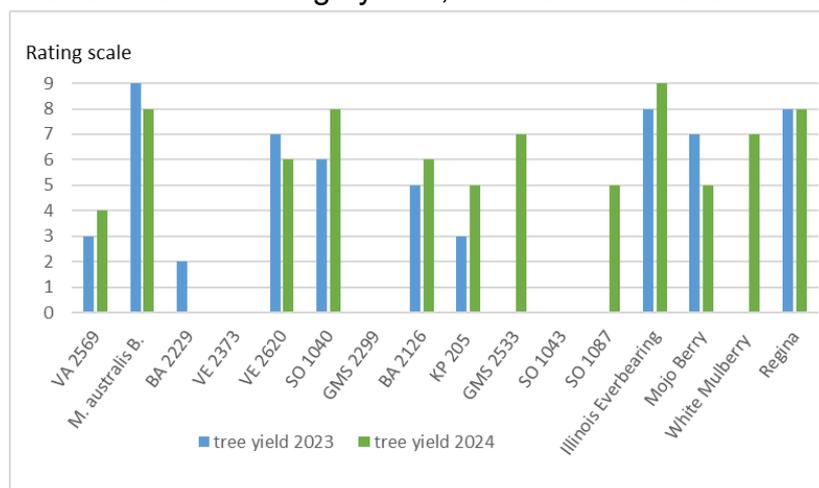


Figure 1: Tree yield in the years 2023-24; rating scale: 1 (no fruit) – 9 (very high yield)

'Illinois Everbearing' had the highest overall taste rating (8/9), with a balanced flavour and citrus notes when not fully ripe. 'Regina' followed with a score of 7/9. 'Regina' and *M. australis* 'Baranya' produced the heaviest fruits, while 'Illinois Everbearing' had the longest fruits (Fruit Form Index >5). 'Mojo Berry' had the highest fruit firmness but was rated lower in taste due to its monotonous sweetness and low Brix values. (Table 1)

Table 1: Fruit characteristics in the years 2023-24 (the cultivars with no values did not have fruits)

Variety name	Fruit colour	Stipe length	Fruit shape-index ¹	Total flavour ² (1 - 9)	°Brix ³	Fruit firmness ³	Comments
VA 2569	yellowish-white	short	2,55	5	15,5	10,3	sweetish (monotonous)
Morus australis B.	reddish-black	middle	3,53	6	18,1	14,8	sweetish
BA 2229							
VE 2373							
VE 2620	violet-brown	long	2,58	5	18,3	7,3	balanced
SO 1040	violet-brown	middle	3,29	6	17,7	6,6	balanced sweetish
GMS 2299							
BA 2126	yellowish-white	short	1,91	5	19,6	6,8	sweetish
KP 205	yellowish-white	middle	2,20	5	26,8	9,6	sweetish
GMS 2533	light pink	short	2,23	5	21,1	9,0	sweetish
SO 1043							
SO 1087	black	short	2,20	5	17,4	16,5	balanced
Illinois Everbearing	reddish-black	long	5,57	8	18,3	9,4	balanced
Mojo Berry'	black	middle	1,99	4	11,2	19,9	monotonous
White Mulberry	yellowish-white	long	3,40	6	18,3	11,4	balanced
Regina	black	middle	2,54	7	18,7	15,0	balanced

¹ =calculated according to the formula: = length² / width²

² =subjectively rated on a scale of 1 = weak to 9 = very good; aggregated data 2023–2024

³ =mean values from measurements taken on 2 days during the main harvest season in 2024

Based on yield and fruit quality, 'Illinois Everbearing' and 'Regina', and probably also *M. australis* 'Baranya' were identified as the most promising varieties for the fresh market. Further research is recommended to explore their transport and storage capabilities, as well as the nutritional content and potential uses for human consumption of leaves.

The citation of the full publication will be found on Ecofruit website as soon as available.