

# SCIENTIFIC DATA REGARDING THE HONEY PHASING IN SUNFLOWER CROPS

*ION NICOLETA\**, *ION V.\*\**, *FOTA G.\**, *COMAN R.\**, *ȘTEFAN V.\*\**

*\* Apiculture Research and Developing Institute of Bucharest*

*\*\* University of Agronomical Sciences and Veterinary Medicine of Bucharest*

## INTRODUCTION

The soil and climate conditions in Romania are favorable for sunflower crop. The sunflower is one of the main field crops in Romania and the most important oilseed plant, being on the third place as cultivated area, after corn and wheat. This makes the sunflower the most important melliferous cultivated plant, ensuring the last great production harvest before winter. This importance results both from the period and the duration of flowering, and from the large number of flowers per unit of area and the great nectar secretion. Yet, the melliferous capacity in sunflower is affected by the climate conditions [3], fact ascertained by beekeepers over great variations in time and space of honey productions. Likewise, the melliferous capacity in sunflower differs from one hybrid to another [1][2], the beekeepers being interested in the melliferous capacities specific to various sunflower hybrids cultivated in our country.

## MATERIALS AND METODS

Researches on the melliferous capacity in sunflower hybrids were carried out in field trials over the year 2008. These researches were established on a reddish preluvosol located at 15 km from Bucharest on a North-East direction. The experiments were placed within the Moara Domnească trial field pertaining to the Phyto-Technical Department of the Faculty of Agriculture within the University of Agronomic Sciences and Veterinary Medicine Bucharest. They were part of researches carried out within the research project no. 106/2005, a CEEX grant.

The objective of these researches was to study the melliferous potential in 4 sunflower hybrids (Fleoret OR, Melodi, Sunko and Arena), cultivated at different calendar periods (sowing periods).

By sowing at different periods it was intended that the flowering period lap other periods with different climate conditions, so that to determine the melliferous potential in the studied hybrids over different climatic conditions and to observe the variation of this potential according to climate conditions.

Each experimental plot measured 21sqm, resulted from 6 rows of plants cultivated at a distance of 70 cm between rows and a row length of 5 m. The experimental designs have been located using the method of dividing plots by 2 factors (the sunflower hybrid and the sowing period).

The quantity of secreted nectar per flower was calculated using the capillaries method, the most employed method in researches. The nectar sugar content was measured using the refractometer.

Parallel to nectar analysis the number of flowers/inflorescence was determined, respectively the number of plants/ha in order to calculate the number of flowers/ha.

The potential honey yield /ha was calculated using the following formula:

$$M = \frac{S_n \times C_n \times D \times N_f \times N_p}{100.000.000} \times 1,25$$

Where: M = potential honey yield (kg/ha);  
S<sub>n</sub> = nectar secretion (mg nectar/flower);  
C<sub>n</sub> = nectar content in sugar (%);  
D = flowering duration of a flower (days);  
N<sub>f</sub> = number of flowers /inflorescence;  
N<sub>p</sub> = number of plants/ha;  
1.25 = quotient of sugar transformation in honey

## RESULTS AND DISCUSSIONS

Over the first period, the observations and melliferous determinations were made during peak flowering, which corresponded with the period 26 June and 01 July 2008. The average nectar quantity secreted by a flower in 24 hours (table 1) ranged from 0,46 mg/flower (in Fleuret OR hybrid) to 0,88 mg/flower (in Melody hybrid). The nectar sugar content ranged 29,34% (in Arena hybrid) and 43,75% (in Melody hybrid), and the potential honey yield varied from 35,22 kg/ha (in Fleuret hybrid) to 66,02 kg/ha (in Melody hybrid).

Over the 2<sup>nd</sup> period, the observations and melliferous determinations were made during peak flowering, which corresponded with the period 2 – 4 June 2008. The average quantity of nectar secreted by a single flower in 24 hours varied from 0,33 mg/flower (in Melody hybrid) to 0,53 mg/flower (in Sunko hybrid). Potential honey yield varied from 41,12 kg/ha (Melody hybrid) to 63,99 kg/ha (Melody hybrid).

Over the third period, researches on the melliferous capacity in sunflower hybrids were carried out during peak flowering that corresponded with the period comprised between 10-14 July 2008. During this sowing period, the nectar sugar content per flower was lower compared to the first and second period, namely, the quantity of nectar produced by a flower in 24 hours varied from 0,4 mg/flower (Melody hybrid) to 0,48 mg/flower (Arena hybrid). Over the third period, the nectar sugar content reached higher average values compared to the first two periods, ranging from 39,07% (in Arena hybrid) to 64,29% (in Fleuret OR hybrid). Though nectar sugar content was higher, the weak nectar secretion per flower has affected the potential honey yield per ha, being smaller compared to the other studied periods. This proves that the factor greatly influencing honey yield is the nectar secretion of flowers. Potential honey yield varied from 45,05 kg/ha (Melody hybrid) to 52,65 kg/ha (Arena hybrid).

Over the fourth period, researches on the melliferous capacity in sunflower hybrids were carried out during the peak flowering, between 14 and 30 of July 2008. Nectar secretion of flowers in 24 hours ranged from 0,4 mg/flower (in Fleuret hybrid) to 1 mg/flower (more precise to 0,74 mg/flower, in Melody hybrid). During the fourth period, the nectar sugar content was the lowest, below 60%, ranging from 56,11% (in Sunko hybrid) to 58,11% (in Fleuret hybrid). The very good nectar secretion of flowers had a positive influence on the potential honey yield, ranging between 41,15 kg/ha (in Fleuret hybrid) and 70,99 kg/ha (in Melody hybrid).

Over the fifth period, researches on the melliferous capacity in sunflower hybrids were carried out during the peak flowering, between 1 and 5 of August 2008. The nectar secretion per flower in 24 hours ranged from 0,66 mg/flower (in Fleuret hybrid) to 1,03 mg/flower (in Melody hybrid), and nectar sugar content varied between 27,83% (in Arena hybrid) and 46,4% (in Fleuret hybrid). Potential honey yield varied between 51,35 kg/ha (in Fleuret hybrid) and 74,67 kg/ha (in Melody hybrid).

Water deficit diminished nectar secretion and increased its sugar content, while water supply improved nectar secretion, and decreased the sugar content. Potential honey yield is firstly determined by the quantity of secreted nectar and then by the nectar sugar content.

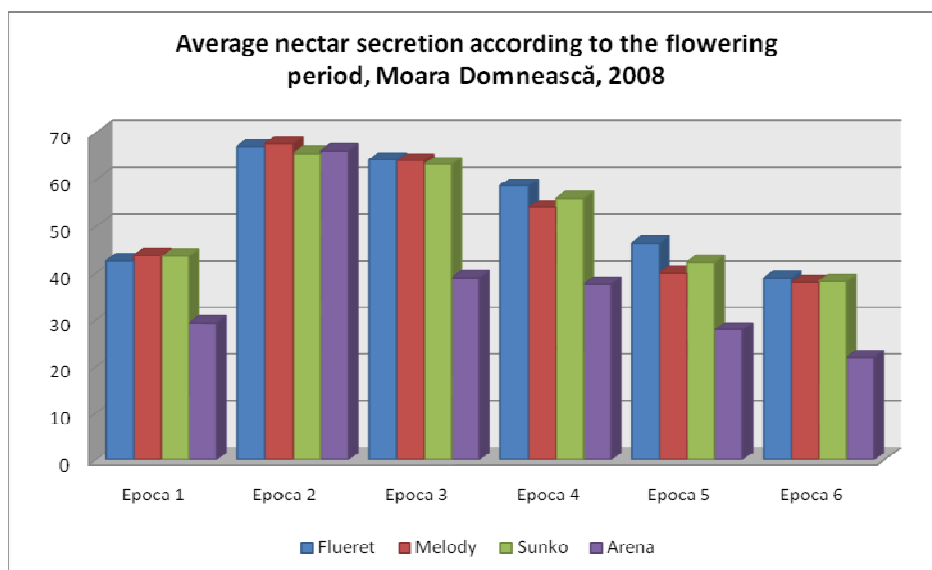


Fig. 1 Average nectar secretion according to the flowering period

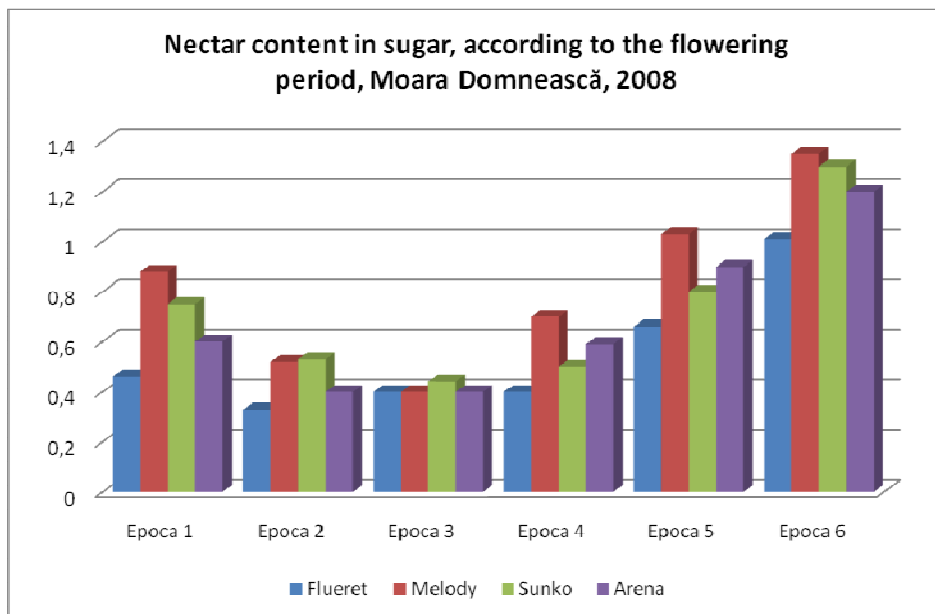


Fig. 2 Nectar content in sugar, according to the flowering period

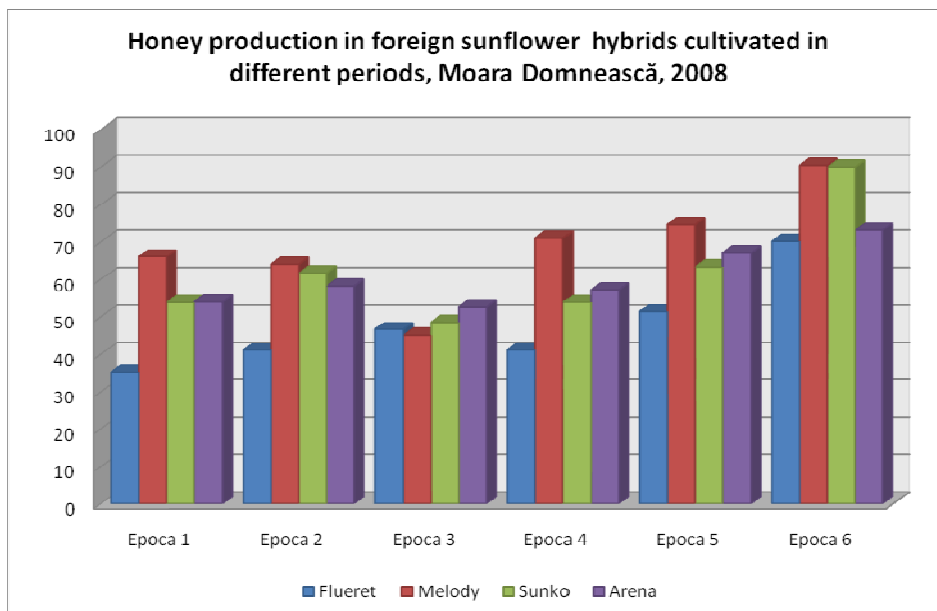


Fig. 3 Honey production in foreign sunflower hybrids cultivated in different periods

## CONCLUSIONS

1. Under the climate conditions of 2008, potential honey yield in sunflower hybrids, studied over different sowing periods, ranged between 35,22 kg/ha (in Fleuret OR hybrid) and 74,67 kg/ha (in Melody hybrid).
2. Water deficit diminished nectar secretion and increased its sugar content, while water supply improved nectar secretion, and decreased its sugar content.
3. Potential honey yield is firstly determined by the quantity of secreted nectar and then by the nectar sugar content, the severe water leading to the smallest potential honey yields.

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