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PP-248 [Beekeeping Technology and Quality]

EUROHONIG®
Innovative Beekeeping solutions

PATENT PENDING

MAGNETTO

validation of a novel, easy-to-use and reliable tool for fast and stress-free capturing of queens

M.Eng. Constantin Dobrescu[1]; Dr. Martin Hintersteiner[1,2]

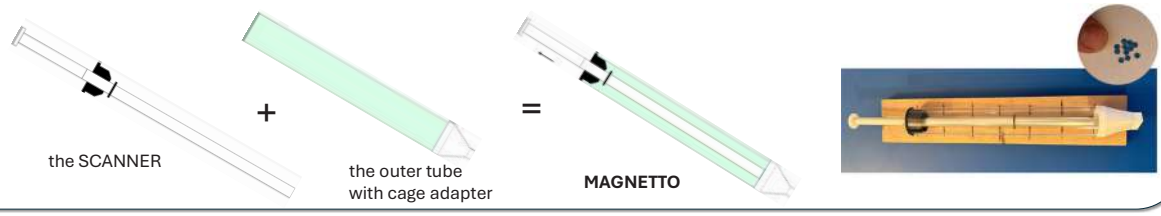
1 Eurohonig SRL, Strada Sandu Aldea 97, 012062 Bucharest Romania
2 Institute for Biological Chemistry, University of Vienna Währinger Straße 38, 1090 Vienna, Austria

Keywords: beekeeping technology, practical beekeeping technologies, improvement of beekeeping practices, queen caging, requeening.

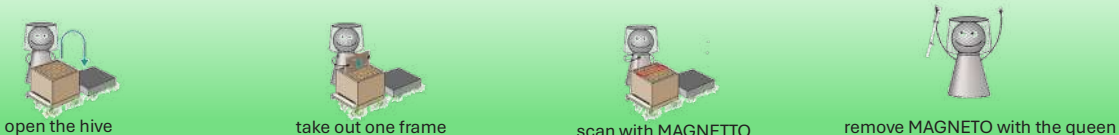
Background
The queen is arguably the most important individual in the honeybee colony: a vital young queen will lead to a strong and healthy population, her pheromone production will keep the colony together, and her genetics will shape the behaviour of the colony. Queens are also the only perennial animal of the colony, and as such more sensitive to intoxication from e.g. acaricides. Hence there are many situations and instances where it is desirable to be able to quickly find, capture and remove the queen from a colony in order to perform certain beekeeping practices, such as re-queening, swarm control, or varroa treatment.

Problem Description
We therefore set out to develop a tool based on magentism, which allow to easily find the queen even in strong colonies without the need for lengthy inspection of individual frames.

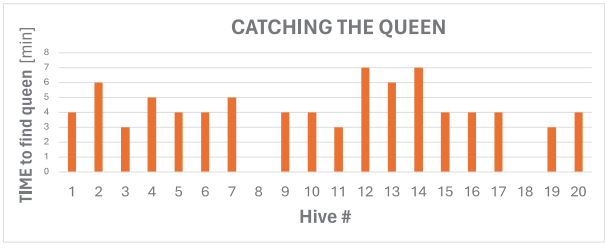
Magnetto – the new tool
It consists of 2 components: the scanner & the outer tube. In addition, ferromagnetic plates are needed for marking the queen



How to find and capture the queen from a hive using MAGNETTO



Validation of MAGNETTO in a field test



Magnetto allows to find and capture a queen from a strong hive within 5 minutes on average with a success rate of 90%.

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Eurohonig SRL , strada Sandu Aldea 97, 012062 Bucharest, Romania www.eurohonig.com Contact: Tel: +40 744823628, eurohonig@gmail.com

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"Magnetto": development and validation of a novel, easy-to-use reliable tool for fast and stress-free capturing of queens

Constantin Dobrescu[1], Martin Hintersteiner[2]
[1]Eurohonig SRL, Strada Sandu Aldea 97, 012062 Bucharest Romania
[2]Institute for Biological Chemistry, University of Vienna Währinger Straße 38, 1090 Vienna Austria

Background
The queen is arguably the most important individual in the honeybee colony: a vital young queen will lead to a strong and healthy population, her pheromone production will keep the colony together, and her genetics will shape the behaviour of the colony. Queens are also the only perennial animal of the colony, and as such more sensitive to intoxication from e.g. acaricides. Hence there are many situations and instances where it is desirable to be able to quickly find, capture and remove the queen from a colony in order to perform certain beekeeping practices.

Problem Description
We therefore set out to develop a tool which would allow to easily find the queen even in strong colonies without the need for lengthy inspection of individual frames.

Methodology
First, from a review of available sensor technologies, magnetism was identified as a robust and promising methodology to solve the research problem. Secondly, a new queen capturing device "Magnetto" was developed featuring the following key components: a) a rod like "queen scanner", with an optimized magnetic surface for covering the whole depth of a commonly used brood box (Dadant or other) b) a cage into which the queen can be released directly from the scanner and c) ferromagnetic plates for queen tagging.

Results and Conclusions
All components and the overall performance of Magnetto were tested in a series of field tests. Initially the metal plate type with the best capture-to-size ratio was selected. Queens tagged with these metal plates did perform indistinguishable to their conventionally tagged sisters. Next, a series of capture experiments was carried out to optimize the different parameters of Magnetto itself. Final tests showed that Magnetto allows to find and capture a queen from a strong hive within 4 minutes on average with a success rate of > 90%.

Practical Implications for Beekeepers
The use of Magnetto offers a series of intriguing benefits to beekeepers by facilitating their current practices: from fast queen caging or queen removal for improved varroa treatment to time efficient requeening a large number of colonies in professional operations or swarm prevention.