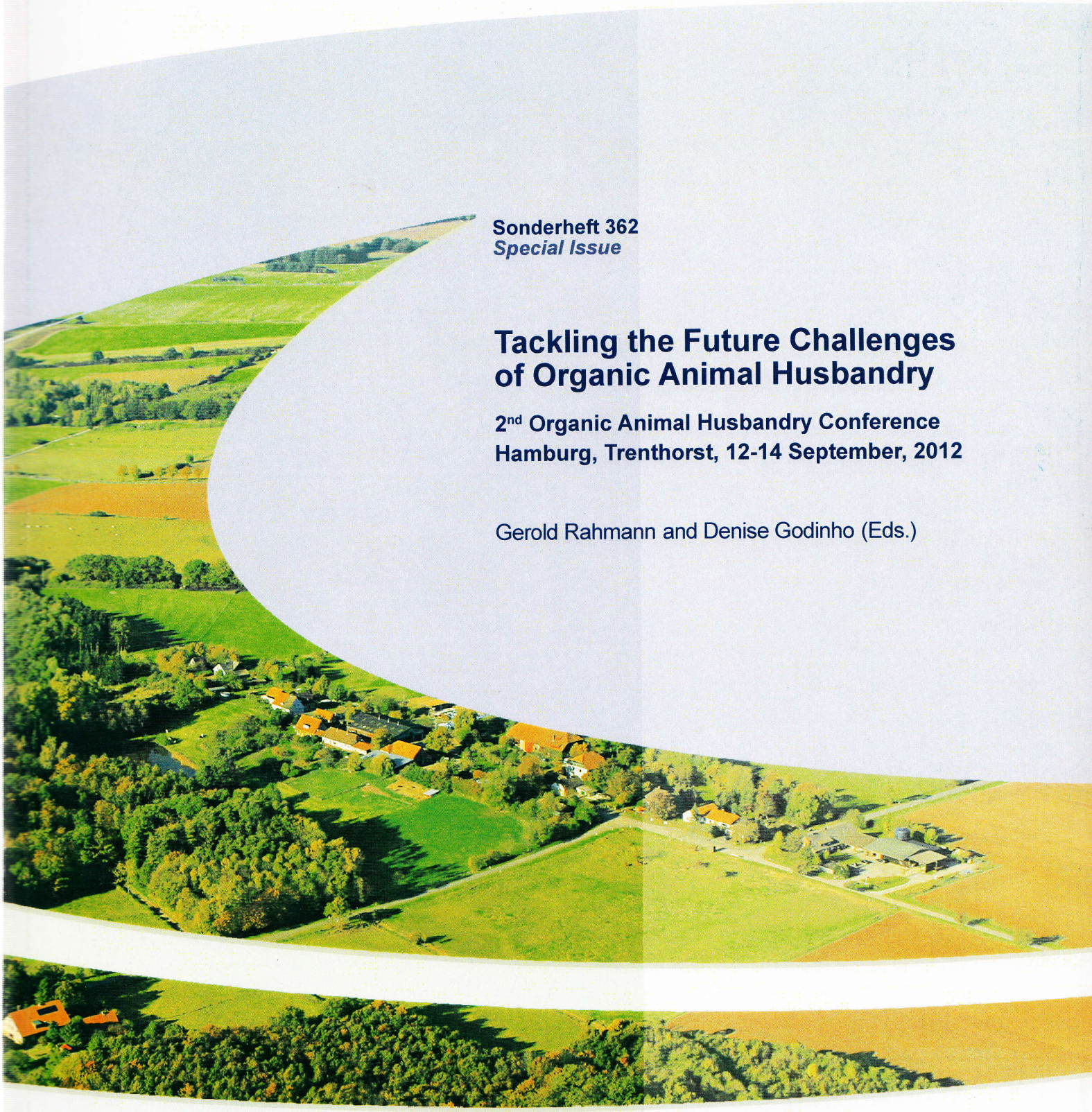
Budrsa 2012

Johann Heinrich von Thünen-Institut



Sonderheft 362
Special Issue

Tackling the Future Challenges of Organic Animal Husbandry

2nd Organic Animal Husbandry Conference Hamburg, Trenthorst, 12-14 September, 2012

Gerold Rahmann and Denise Godinho (Eds.)

Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz

Bibliographic information published by the German National Library

The German National Library lists this publication in the German National Bibliography; detailed bibliographic data are available in the internet at http://www.d-nb.de/

Bibliografische Information der Deutschen Bibliothek

Die Deutsche Bibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über http://www.d-nb.de/ abrufbar.

Johann Heinrich von Thünen-Institut

2012

Landbauforschung
vTI Agriculture and Forestry Research

Johann Heinrich von Thünen-Institut
Federal Research Institute for Rural Areas, Forestry and Fisheries,

Johann Heinrich von Thünen-Institut
Bundesforschungsinstitut für Ländliche Räume, Wald und Fischerei (vTI)

Bundesallee 50, D-38116 Braunschweig, Germany

Responsibility for the content rests exclusively with the authors.

Die Verantwortung für die Inhalte liegt bei den jeweiligen Verfassern bzw. Verfasserinnen.

landbauforschung@vti.bund.de
www.vti.bund.de

Preis / Price 18 €

ISSN 0376-0723
ISBN 978-3-86576-094-4

Agriculture and Forestry Research, Special Issue No 362 (Braunschweig, 2012) ISSN 0376-0723
Download: www.vti.bund.de/en/startseite/vti-publications/landbauforschung-special-issues.html

Integrative medicine treatments can improve the resistance of organic honeybee's families to common pathologies

CLAUDIA LOTTI[1], ANDREA MARTINI[1], CINZIA SASSOLI[1], DUCCIO PRADELLA[2], ANTONELLA CERSINI[3], FLAVIA TACCORI[3], GIUSEPPE RAGONA[3], RICCARDO DAINELLI[4]

[1] Department of Plant, Soil and Environmental Science (DI.P.S.A.), Italy, www.dipsa.unifi.it/, eMail: claudia.lotti@unifi.it

[2] Associazione Regionale Produttori apistici Toscani (ARPAT), Italy, www.arpat.info/, eMail: arpat@tin.it

[3] Istituto Zooprofilattico Sperimentale delle Regioni Lazio e Toscana, Italy, www.izslt.it/, eMail: ragona.g@libero.it

[4] Department of Agricultural and Forest Economics, Engineering, Sciences and Technologies (D.E.I.S.T.A.F.), Italy, www.deistaf.unifi.it, eMail: riccardo.dainelli@unifi.it

Abstract

The aim of this work is testing the efficiency of homeopathy to improve the resistance of bee families. 20 hives was divided at random in two groups: 10 were treated with Calcarea Sulphurica 200 CH (C) and 10 received only water (W). To control Varroasis, the groups were both treated with block brood and Api-Bioxal (based on oxalic acid). We recorded the incidences of Varroa destructor by counting the natural mite fall, and by detecting through PCR the presence of Nosema spp. and virus. We evaluated the honey production by weighing beehives and supers. All data were statistically analysed. After the brood block, natural mite fall diminished in group C, but only after Api-Bioxal this difference became significant. At first, Nosema increased in group C, but after completely disappeared. Some viruses showed significant difference between groups. Beehive weight and honey production didn't' show significant differences between groups. The first results could indicate the efficiency of homeopathic treatments in controlling Varroasis and Nosemosis.

Key words: homeopathy, integrative medicine, beekeeping, Varroasis, Nosemosis, virus

Introduction

Beekeeping plays an important role in organic agriculture. For years health problems caused by parasites and pathologies affect this field, with inevitable beehive death and income decrease for beekeepers. The EU regulation for organic agriculture sets standards for the treatment of diseased animals in the Member states (Commission Regulation (EC) No 889/2008, Article 24). The objective of this regulation is to minimize the utilization of traditional veterinary medicines. Additionally, the EU regulation explicitly promotes the use of holistic oriented therapies, such as homoeopathy and phytotherapy. The ideas and philosophy behind some of these treatments are in accordance with the pillars of organic agriculture. This is evident from the belief that the use of medical substances obtained from natural sources can circumvent, or reduce, the use of chemicals that may be harmful to either the environment or human beings (Vaarst et al., 2004). In many organic farms, methods and practices of alternative medicine are combined with conventional ones (Del Francia, 1985; Pignattelli and Martini, 2007). Nowadays, this combination of practices and methods between alternative and conventional medicine is currently defined as 'integrative medicine'.

Material and methodology

The experimentation tested the efficiency of homeopathic remedy to improve the resistance of honeybee's families towards the common pathologies. The trial was carried out over a whole year. In an apiary of 40 beehives, situated in Florence province. 20 hives were divided *at random* in two experimental groups. At fixed date, 10 families were treated with one monodose of Calcarea Sulphurica 200 CH, dissolved in mineral water and sprayed 20 times over the hive frames (C). On the remaining 10, as control group, only water was sprayed (W). The remedy was selected according skin symptoms, general symptoms (sensitive to cold, wet weather) and literature (Persano Oddo and Marinelli, 2002).

Every beehive was treated with biomechanical treatment against *Varroa destructor* such as brood block and Api-Bioxal (drug based on oxalic acid) dripped over the hive frames. We recorded: natural fall of *Varroa d.* mite (after every treatments we counted for 21 days every 3 days the mite on the hive bottom), number of mite on adult bees (sample of 200 bees for hive), bee family strength (measured by 'Sixth method'), presence of *Nosema Spp.* and its belonging to *N. apis* or *N. ceranae* by PCR-RLFP, the presence of principal virus such as Deformed Wing Virus (DWV), Black Queen Cell Virus (BQCV), Sacbrood Bee Virus (SBV), Israeli Acute Paralysis Virus (IAPV), Kashmir Bee Virus (KBV), Acute Bee Paralysis Virus (ABPV), Chronic Bee Paralysis Virus (CBPV) by RT-PCR and TEM-Microscopy Electron Transmission (Various Authors, 2010). In addition, we evaluated the honey production weighing beehives and supers through a dynamometer directly on apiary. Nominal data (presence of *Nosema spp.* and viruses) were analysed by Contingency analysis. The continuous data (number of natural *Varroa d.* fall, number of mite on adult honeybee, strength of bee family, weight of hive and honey production) were analysed by one-way ANOVA, in which the group was assigned as a fixed factor (SAS, 2002).

Results

After one year of trial, 13 families survived: 7 on C group and 6 on W group. After the block of brood (second part of July), the natural fall mite became different between groups, but only after the Api-Bioxal treatment (early August) the difference between groups resulted significant (71.94 C vs. 134.35 W). Afterward, we didn't observe any difference between groups (Figure 1).

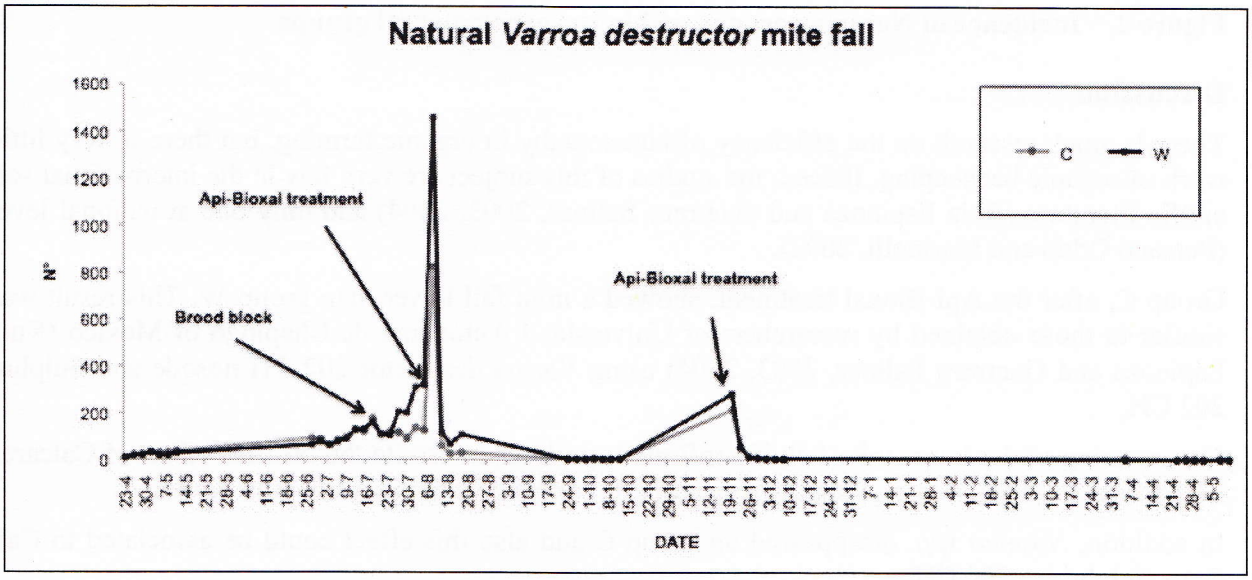


Figure 1. Natural *Varroa d.* mite fall every three days

The number of *Varroa d.* adults and the beehive strength never showed significant difference between groups. Beehive weight resulted significantly higher in July than in April. Honey production was higher in April (Acacia honey) than in July (Chestnut honey) but in both cases there weren't significant differences between groups.

At first, *Nosema spp* increased, and then it completely disappeared on group C (Figure 2). From the genetic characterisation of *Nosema spp.* it resulted that all the samples analysed belonged to *N. ceranae*. It recently spread on large European areas, substituting the indigenous *N. apis*, with completely different symptoms from the classic Nosemosis. Several viruses were detected on beehive in both groups in different times. The KBV virus was never detected.

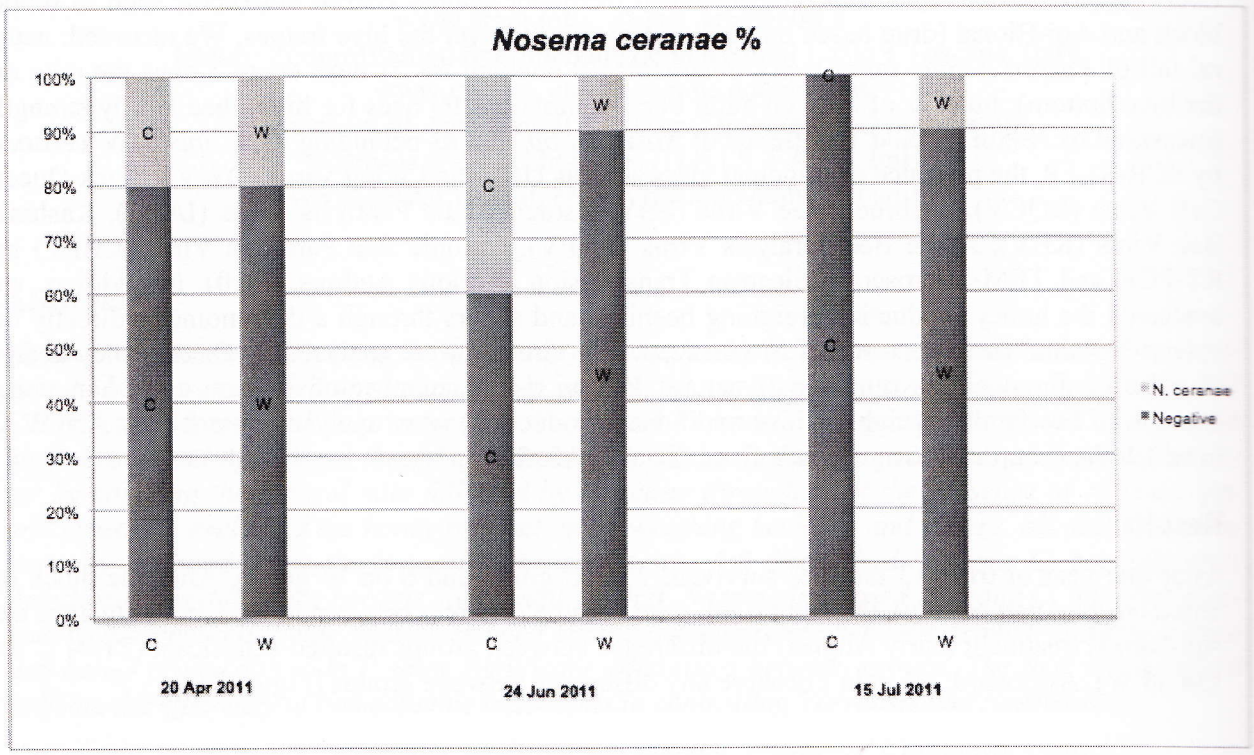


Figure 2. Incidence of Nosema ceranae within the experimental groups

Discussion

There is much research on the efficiency of homeopathy in organic farming, but there is very little work of organic beekeeping. Indeed, the studies of this subject are very few in the international scientific literature (Ruiz Espinoza and Guerrero Salinas, 2003, 2004) and only one at national level (Persano Oddo and Marinelli, 2002).

Group C, after the Api-Bioxal treatment, showed a mite fall lower than group W. This result was similar to those obtained by researchers of Universidad Autónoma de Chapingo of Mexico (Ruiz Espinoza and Guerrero Salinas, 2003, 2004) using Varroa destructor 202 CH nosode and Sulphur 202 CH.

The meaning of the lower mite fall, if confirmed, could demonstrate the positive effect of Calcarea Sulphurica 200 CH on improving the resistance of honeybee's families towards *Varroa d.*

In addition, *Nosema spp.* disappeared on group C and also this effect could be associated to Calcarea Sulphurica 200 CH.

These results should be checked with other further trials. At present, we have just started a second trial, in another apiary, to investigate the efficiency of this homeopathic treatment.

Suggestions to tackle the future challenges of organic animal husbandry

Our work had the worth to develop a holistic study model of an apiary, considering at the same time different aspects such as biological, productive and pathological ones. We used the model to test homeopathy integrated with biomechanical treatments in an organic apiary to control pathologies, but this should be useful to test other remedies or drugs on organic beekeeping.

References

Del Francia F(1985): Omeopatia veterinaria. Edizioni di red./studio redazionale, Como, 3-25.

Persano Oddo L, Marinelli E (2002): Impiego di prodotti omeopatici nella lotta contro *Varroa destructor* Anderson & Trueman. Atti XIX Congresso Nazionale di Entomologia, Catania, 10-15 giugno.

Ruiz Espinoza FJ, Guerrero Salinas JI (2003): Control homeopatico del acaro (*Varroa destructor* Oud.) en abejas. (Fase I). Seminario de Avances y Resultados de Investigación del Programa de Agricultura Orgánica.

Ruiz Espinoza FJ, Guerrero Salinas JI (2004): Control homeopatico del acaro (*Varroa destructor* Oud.) en abejas. (Fase II). Seminario de Avances y Resultados de Investigación del Programa de Agricultura Orgánica

Pignatelli P, Martini A (2007): Omeopatia. In Pignatelli P. Medicina veterinaria non convenzionale. Edagricole, 13-53.

SAS (2002): User's Guide: Statistics, Version 8.2. SAS. Institute. Inc., Cary, NC, USA.

Vaarst M, Martini A, Bennesgard TW, Hecktoen L (2004): Approaches to the treatment of diseased animals. In: Vaarst M, Roderick S, Lund V, Lockeretz W (eds.): Animal Health and welfare in Organic Agriculture. CABI Publishing, 279-307.

Various Authors (2010): Aspetti igienico-sanitari in apicoltura, terza edizione (luglio), Quaderni di zooprofilassi, periodico dell'Istituto zooprofilattico sperimentale delle regioni Lazio e Toscana, Roma.