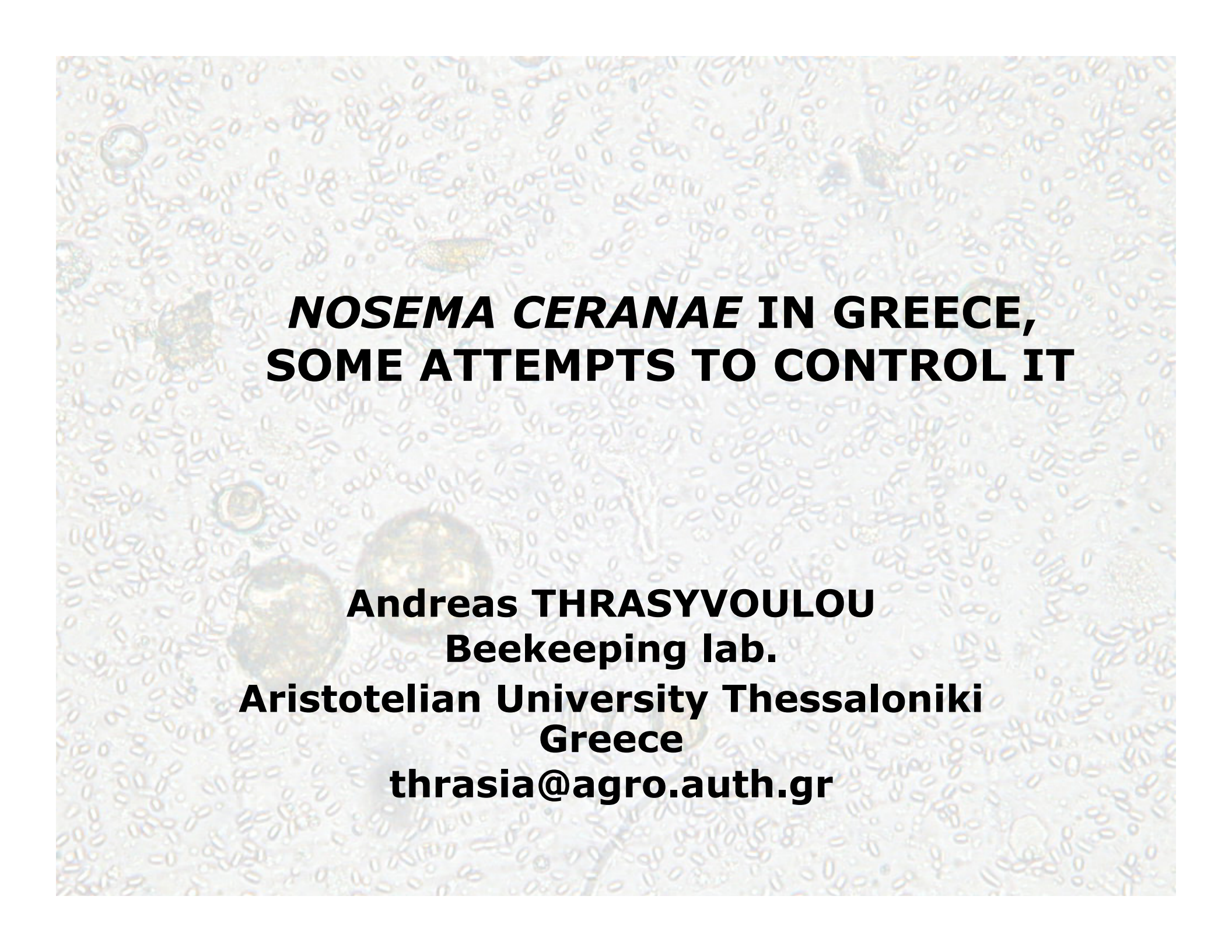


The background of the slide is a microscopic image showing a dense field of small, oval-shaped spores, which are the causative agent of Nosema ceranae. The spores are light-colored and have a distinct internal structure. Some larger, more complex structures are also visible, possibly representing other microorganisms or cellular debris.

***NOSEMA CERANAE* IN GREECE, SOME ATTEMPTS TO CONTROL IT**

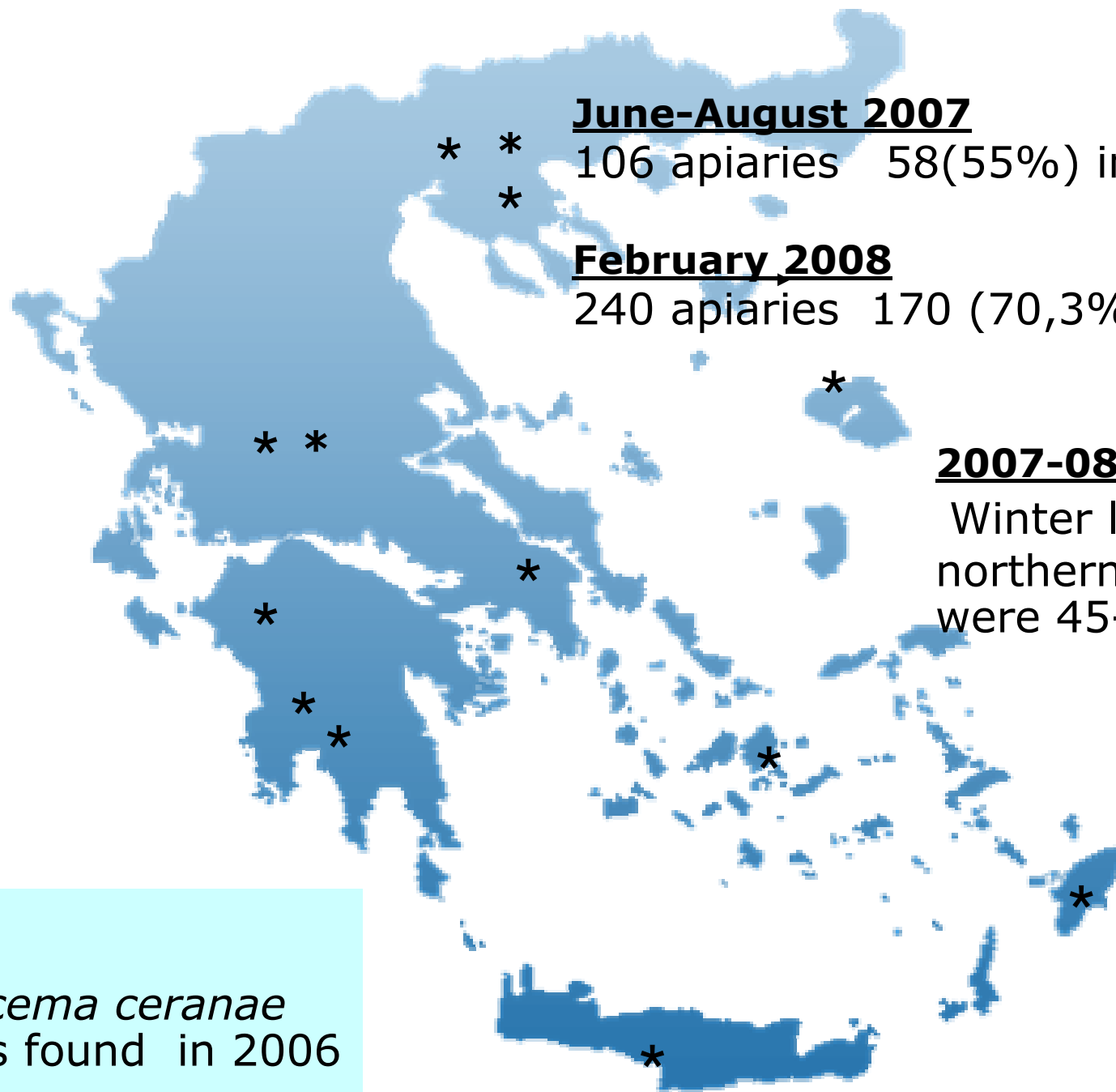
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June-August 2007

106 apiaries 58(55%) infested

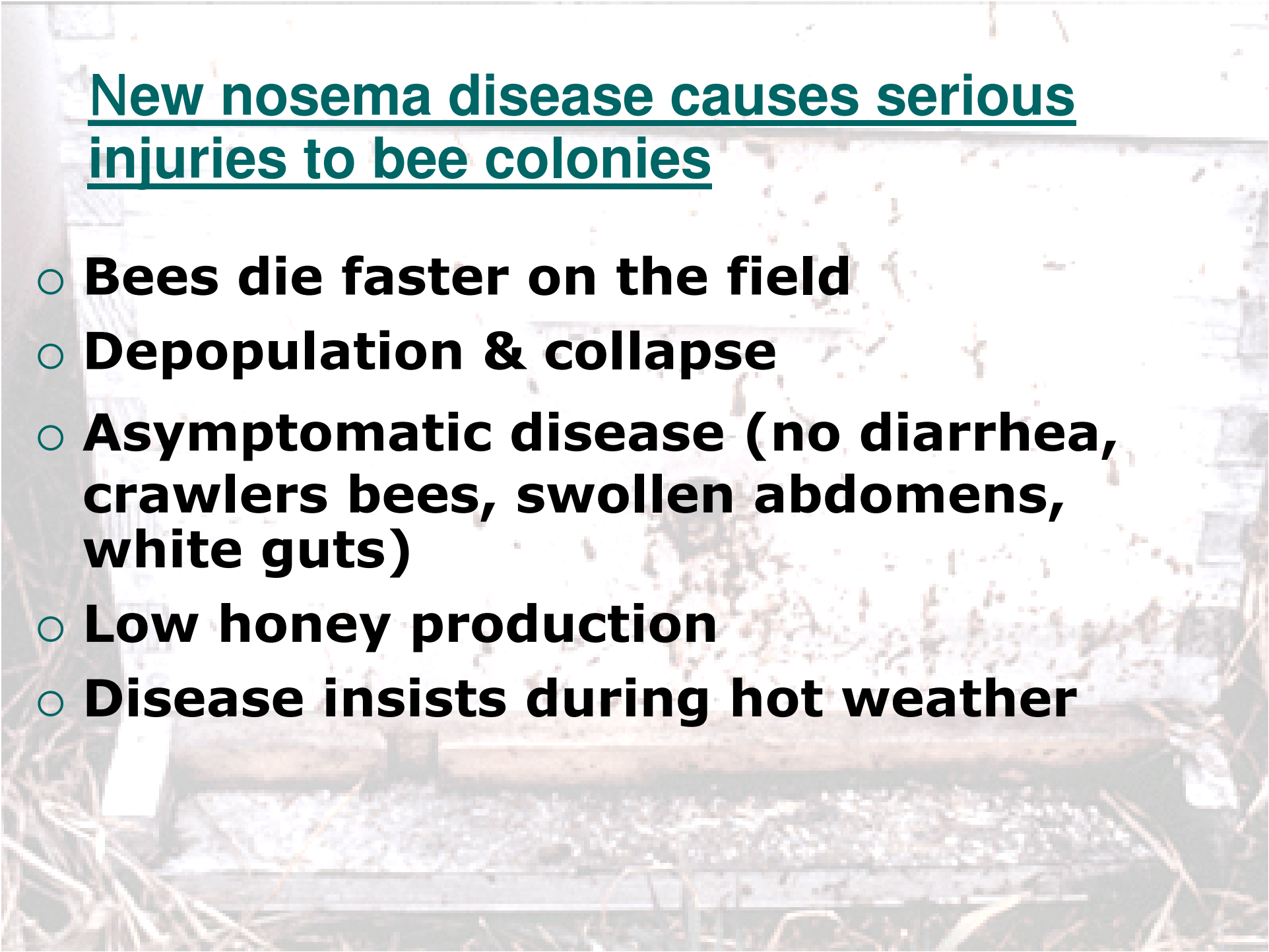
February 2008

240 apiaries 170 (70,3%) infested

2007-08:

Winter losses in
northern Greece
were 45-65%

Nocema ceranae
was found in 2006



New nosema disease causes serious injuries to bee colonies

- **Bees die faster on the field**
- **Depopulation & collapse**
- **Asymptomatic disease (no diarrhea, crawlers bees, swollen abdomens, white guts)**
- **Low honey production**
- **Disease insists during hot weather**



Good management practices

- Good control of Varroa mites
- Feed colonies with pollen or protein supplement in fall.
- Keep strong colonies
- Winter colonies in sunny locations.
- Avoid having stagnant water sources.
- Sterilize contaminated combs with heat or acetic acid (49° C for 24 hours).
- Minimize colony stress.

Fumagillin: in non-EU countries

Protofil: Alcoholic extract from plants (Romania)

Nosestat: Formic acid +iodine (Bulgaria)

Thymol and garlic in syrup (Greece)

Vita feed Gold:

Concentrated extract of *Beta vulgaris cv altissima* containing salicylic acid

ApiHerb: A herb based honey bee feeding (Italy)

Nozevit: Natural extract of oak bark (Croatia)



How to assess the effectiveness of the treatments for controlling Nosemosis?

Number of spores before treatment (**b**)

Number of spores after treatment (**a**)

Differences between b and a (**d**)

$$\text{Efficacy} = \frac{d \cdot 100}{b}$$

How to find an accurate count of the number of spores present in one bee colony?

The OIE Manual of Diagnostic Tests for Terrestrial Animals (2004, Chapter 2.9.4)

Collect 60 bees from the entrance fixed in 4% formol

Standardised procedure

Examine 10 bees



Follow the protocol of Cantwell 1970
Am. Bee J. 34(9):222-223

Nonquantitative method



1



2



3



6

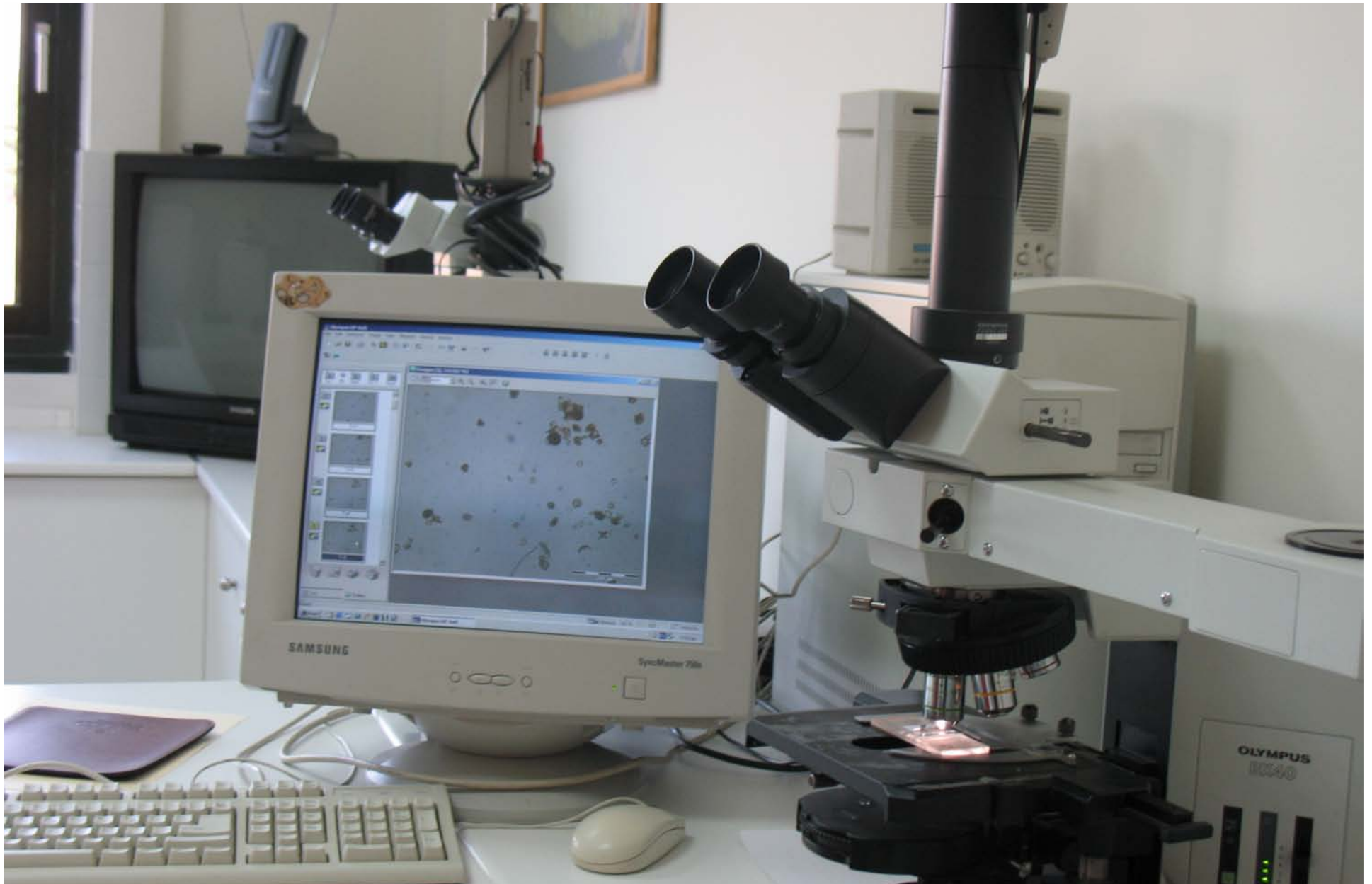


5



4





Spores were counted in haemocytometer at a magnification of 400 under a light microscope equipped with image analysis Pro-Plus 6.1 software



Heavy infestation impossible to count

Administration of therapeutic agents

Product	Posology	Application
Fumidil B (2% a.i.)	25 g/20 L syrup	One L syrup every week. Total 3 L
Vita Feed Gold	10 g/100 ml syrup	10 ml syrup/frame population on the days 1, 3, 5, 7, 9.
Nosestat (vial 1 and 2)	The two vials were mix and 5 ml of the mixture is added in every one L of syrup	500-800 ml syrup/ colony in three consecutive days
Protofil	20 ml/ L syrup	250 ml syrup/colony Two times within a week interval
Garlic	5 g powder garlic in every kg sugar used for sugar-paste	Feeding bees for one month with sugar paste
Thymol	1g thymol in 15 L syrup	One L of syrup every week . Total 3-4 L

Efficacy of therapeutic agents against nocemosis (n=300)

Products	<i>Nocema apis</i>			<i>Nocema ceranae</i>	
	Apr-May 2006 (S)	Sep-Oct. 2006 (s)	Dec-Feb 2006-07 (p)	Oct-Nov 2007 (p)	April-May 2008 (s)
Fumidil B	88 ab	95 a	95 a	76 a	92 a
Vita Feed Gold	98 a	85 b	90 a	52 b	78 b
Nosestat	78 c	86 b	82 a	42 b	70 b
Protofil	83 bc	76 b	90 a	56 b	65 c
Garlic	-	45 c	88 a	25 c	45 d
thymol	-	-	-		76 b
Control	33 d	20 d	89 a	12 c	25 e

S: treatment with syrup P: treatment with sugar paste
Means with the same alphabet letter are not significant

Conclusions

- *N. ceranae* causes significant losses to bee colonies.
- It can be control by good management practices combined with a sound therapeutical treatment

► Strong colonies free as possible from Varroa
► Winter young and well fed bees with protein in sunny locations
► Sterilize contaminated combs
► Minimize colony stress
etc

Fumidil
Vita Feed Gold
Nosestant
Protofil
Thymol