

Small hive beetle in Italy: update, surveillance and constraints

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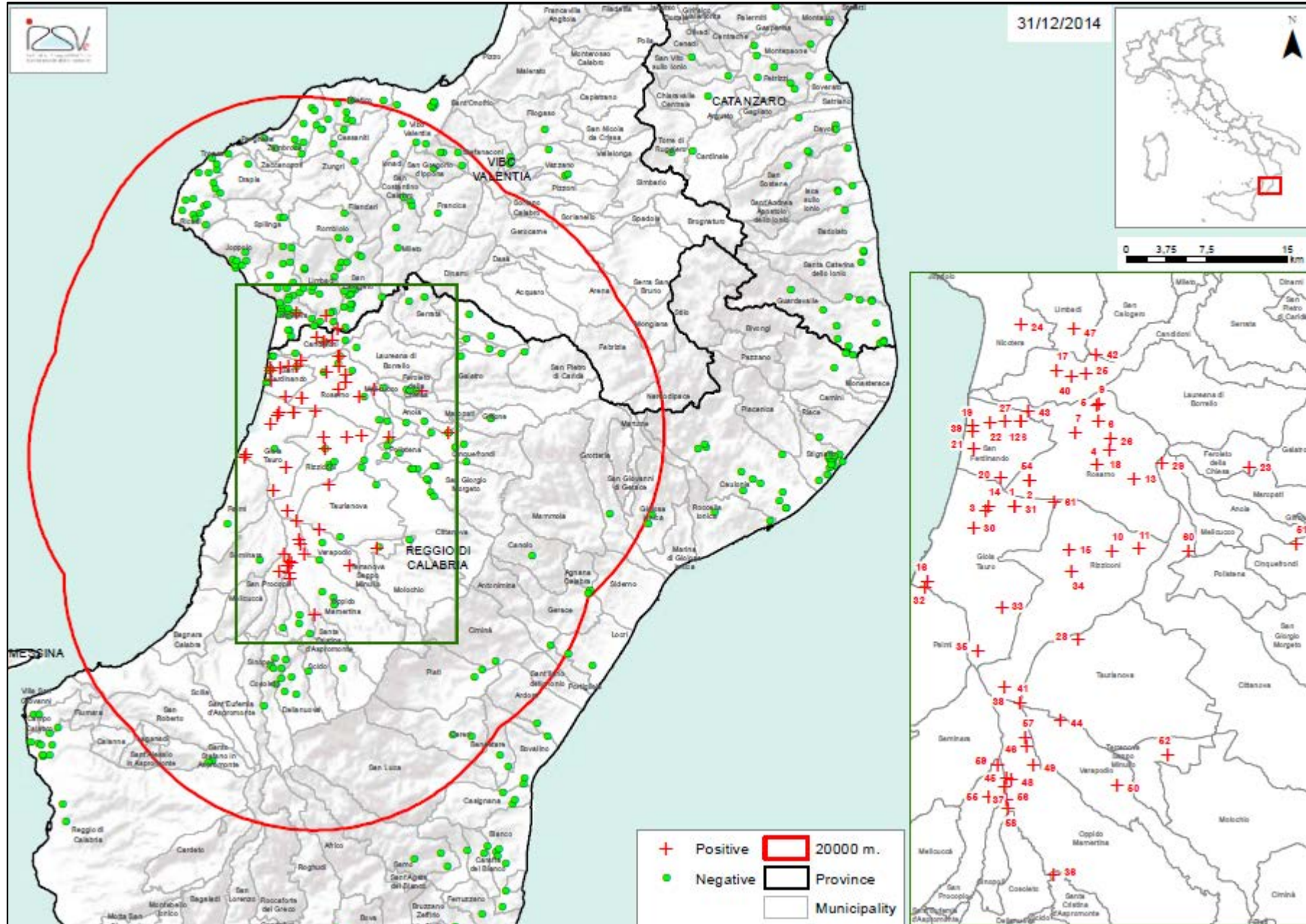
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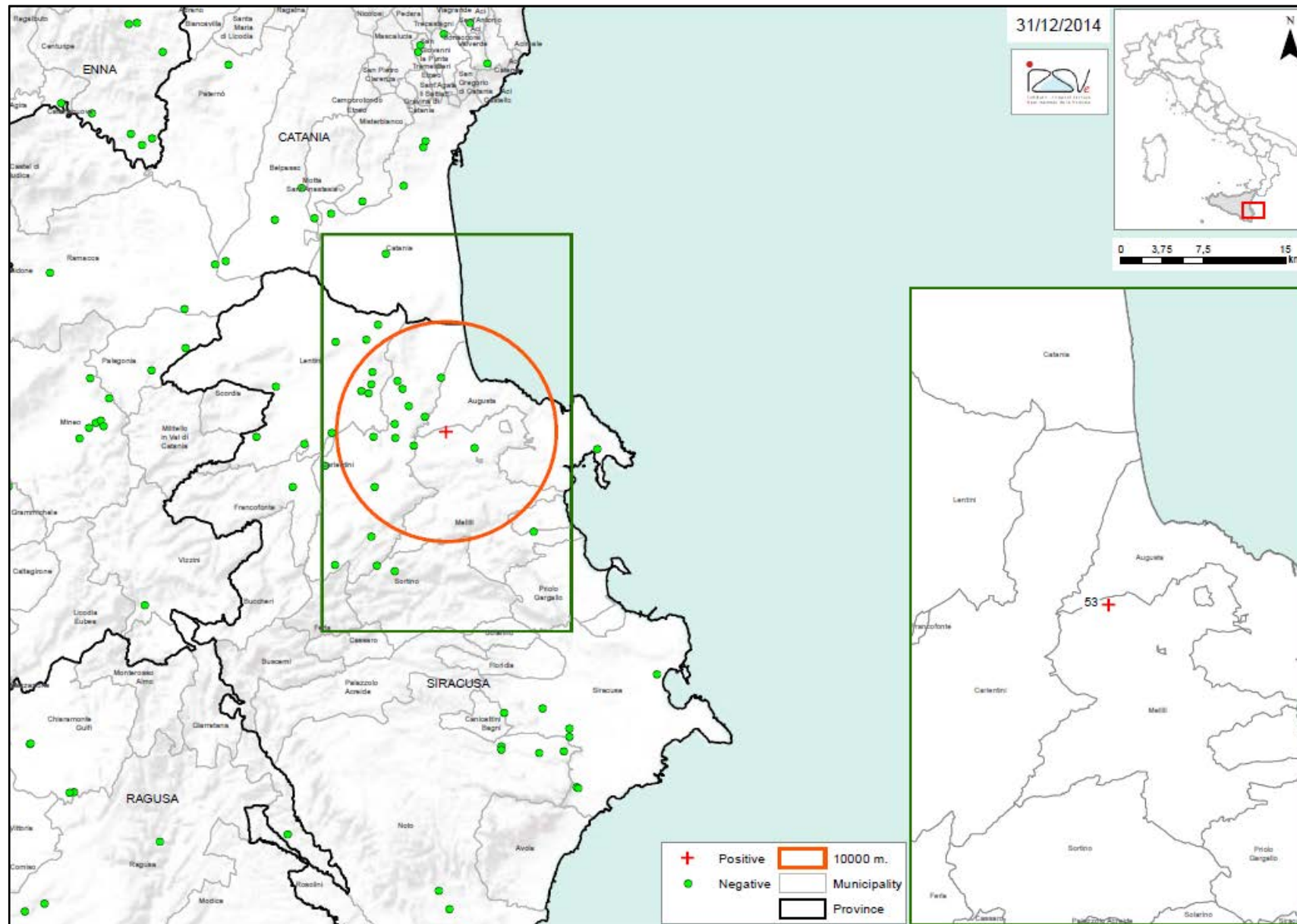
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Expert Group on Bee Health, Brussels 13 January 2017

2014 - Calabria region: 60 infested apiaries

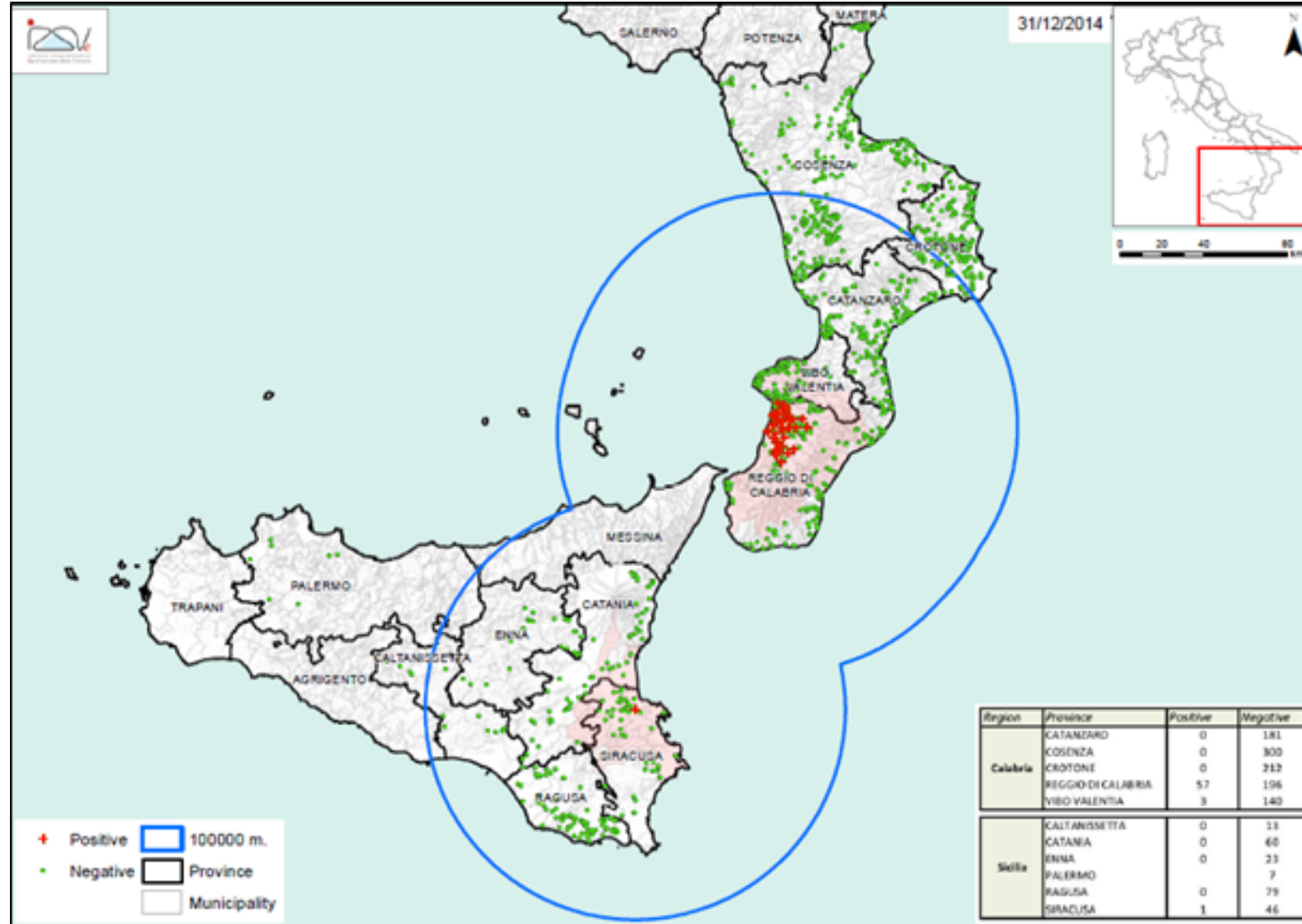


Sicily region - 7 November 2014



- Melilli (SR) municipality
- migratory apiary with 56 hives
- in the Gioia Tauro area from April to August 2014

Surveillance 2014



Eradication and/or containment of the infestation

Measures applied

- Immediate notification of *Aethina tumida*
- Restriction of any movement related to honey bee colonies (IN and OUT)
- Census of apiaries and colonies

20 km protection zone:

- census of apiaries
- visit of all apiaries
- visit of the colonies according to 5% expected prevalence
- **destruction** of the infested apiaries (@3,200 hives in 2014; @2,900 in 2015) and **compensation** (according with a specific decree)
- if negative, traps should be applied
- traceability of commercial and migratory movement in and out of the zone



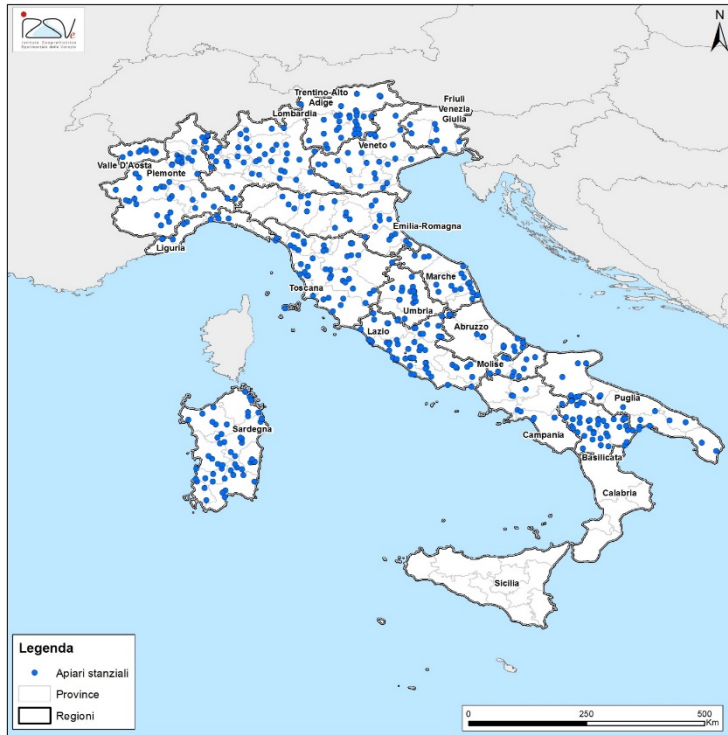
Measures applied

Surveillance zone (The whole territory of the two concerned regions):

- census of apiaries
- visit of apiaries selected on the basis of risk analysis (migration in infested areas, honeybees or materials exchanges) or randomly
- visit of the colonies according to 2% expected prevalence
- destruction of infested apiaries
- if negative, traps should be applied
- traceability of commercial and migratory movement in and out of the zone

 No positive apiaries in the surveillance zone

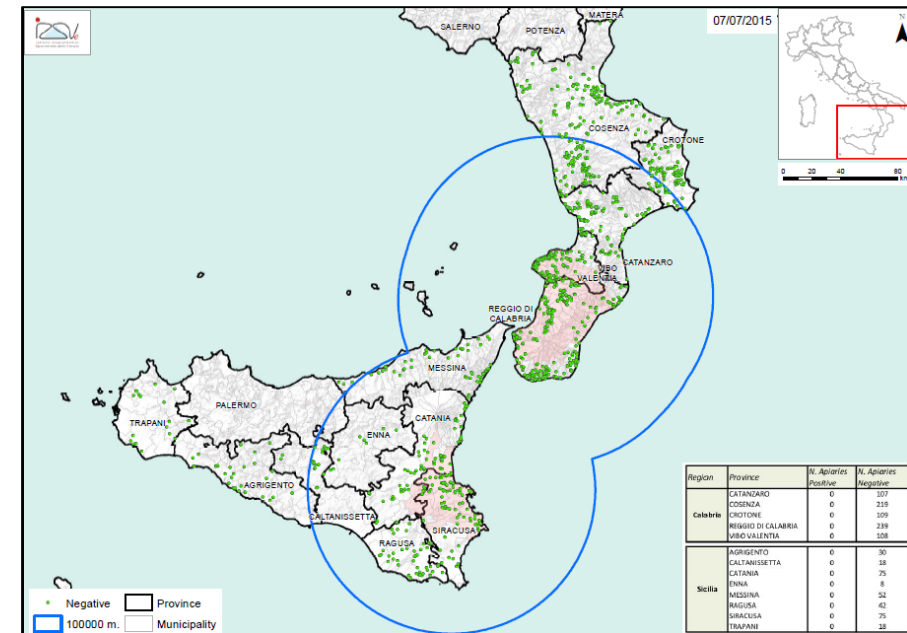
National surveillance plan 2015 non migratory apiaries randomly selected



National surveillance plan 2015 migratory apiaries (risk-based)



Surveillance plan 2015 Calabria and Sicily



SHB re-occurrence – September 2015

September 16, 2015

One apiary in Taurianova municipality
30 artificial swarms (6.08.15) + 2 natural swarms
(captured on site, 16 and 22.08.15)

September 28, 2015

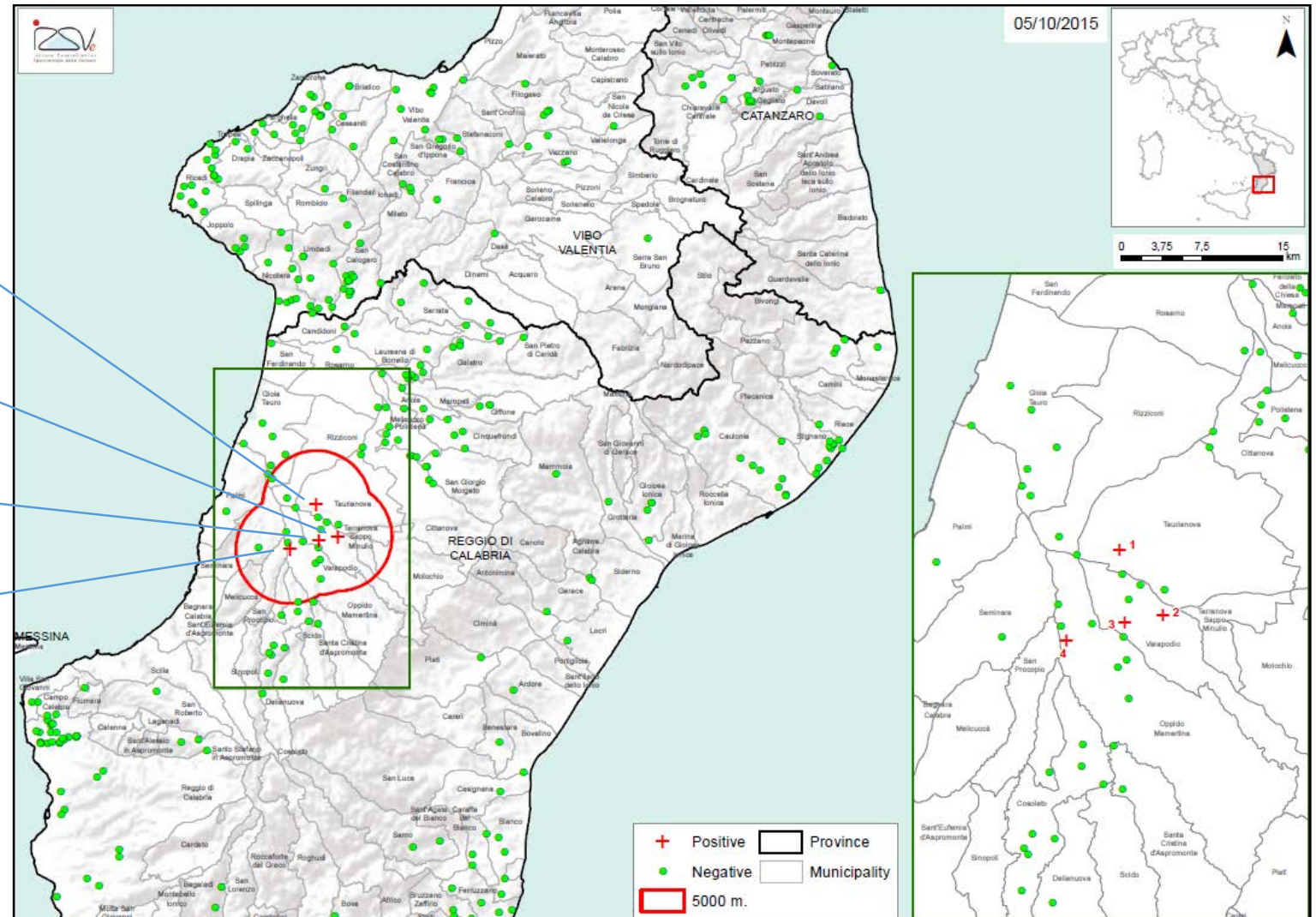
One apiary in Varapodio municipality
66 beehives

September 28, 2015

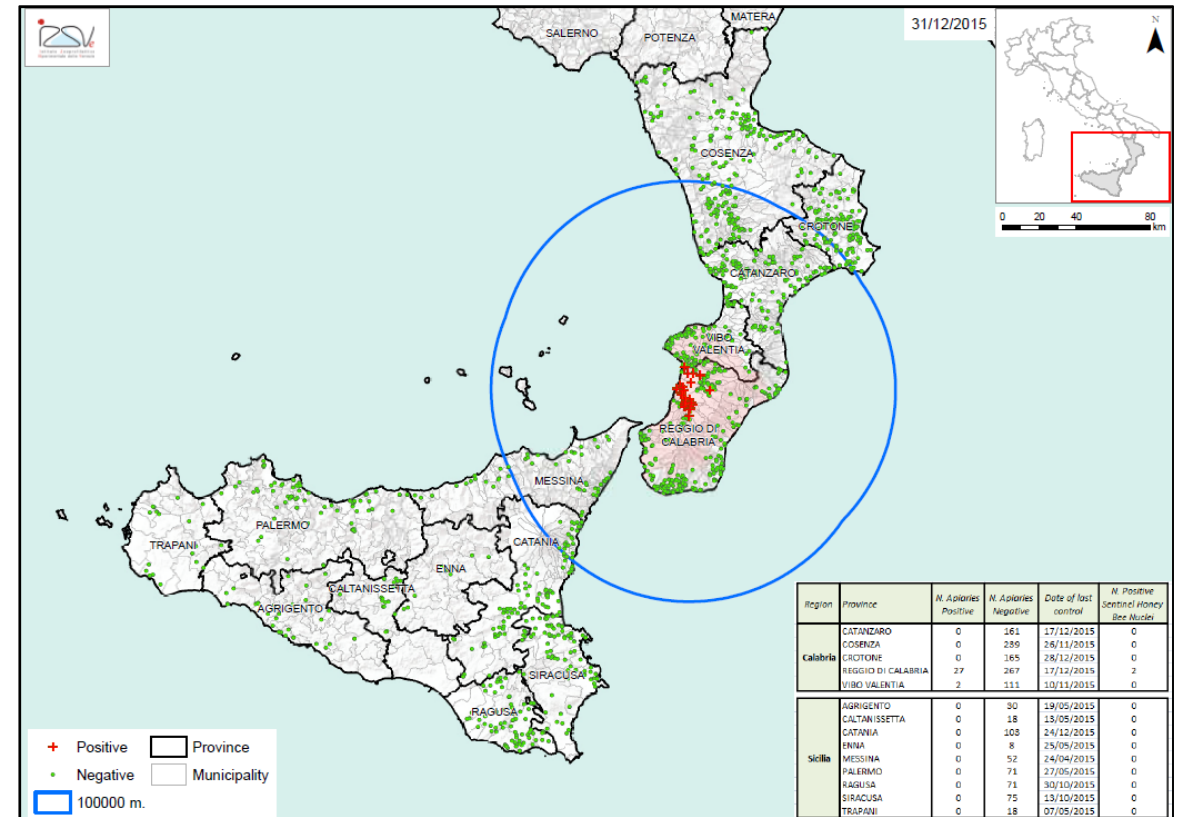
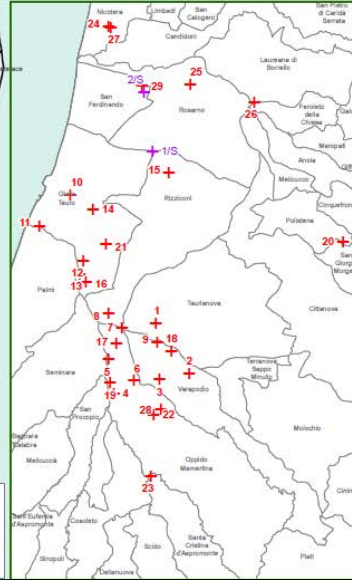
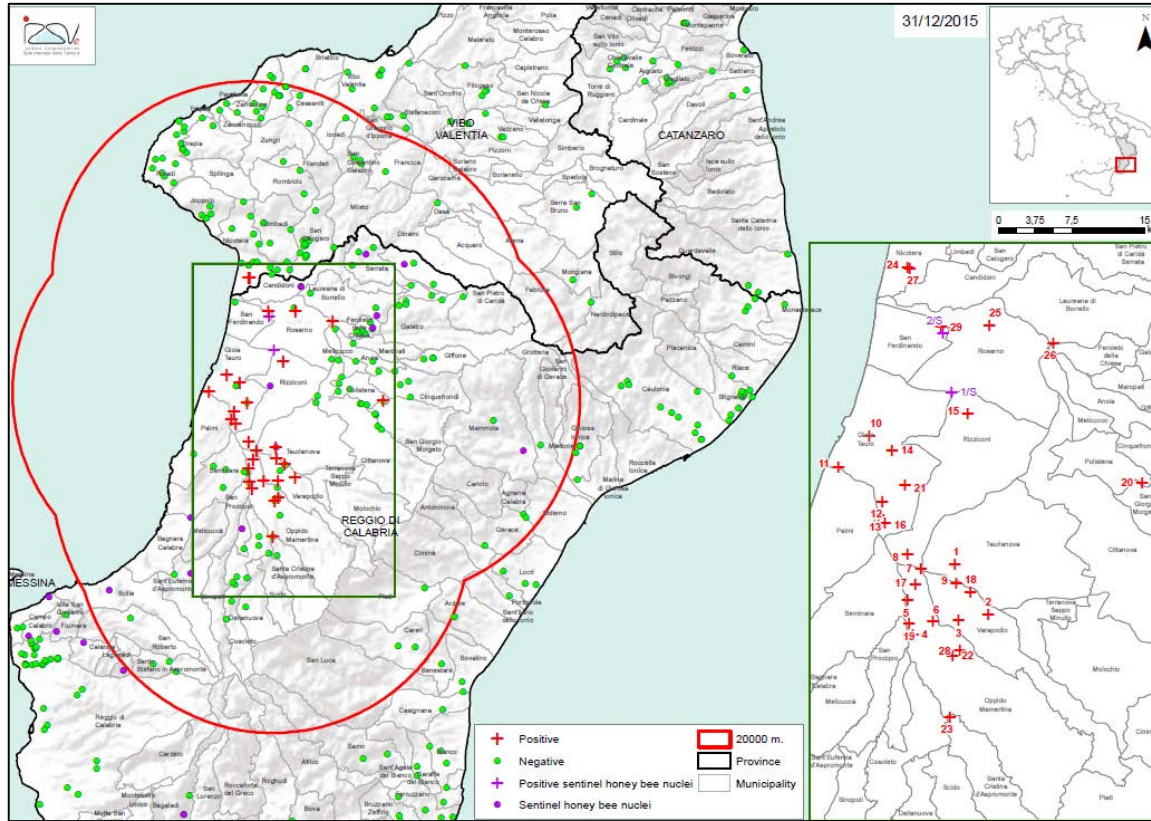
One apiary in Varapodio municipality
92 beehives

September 29, 2015

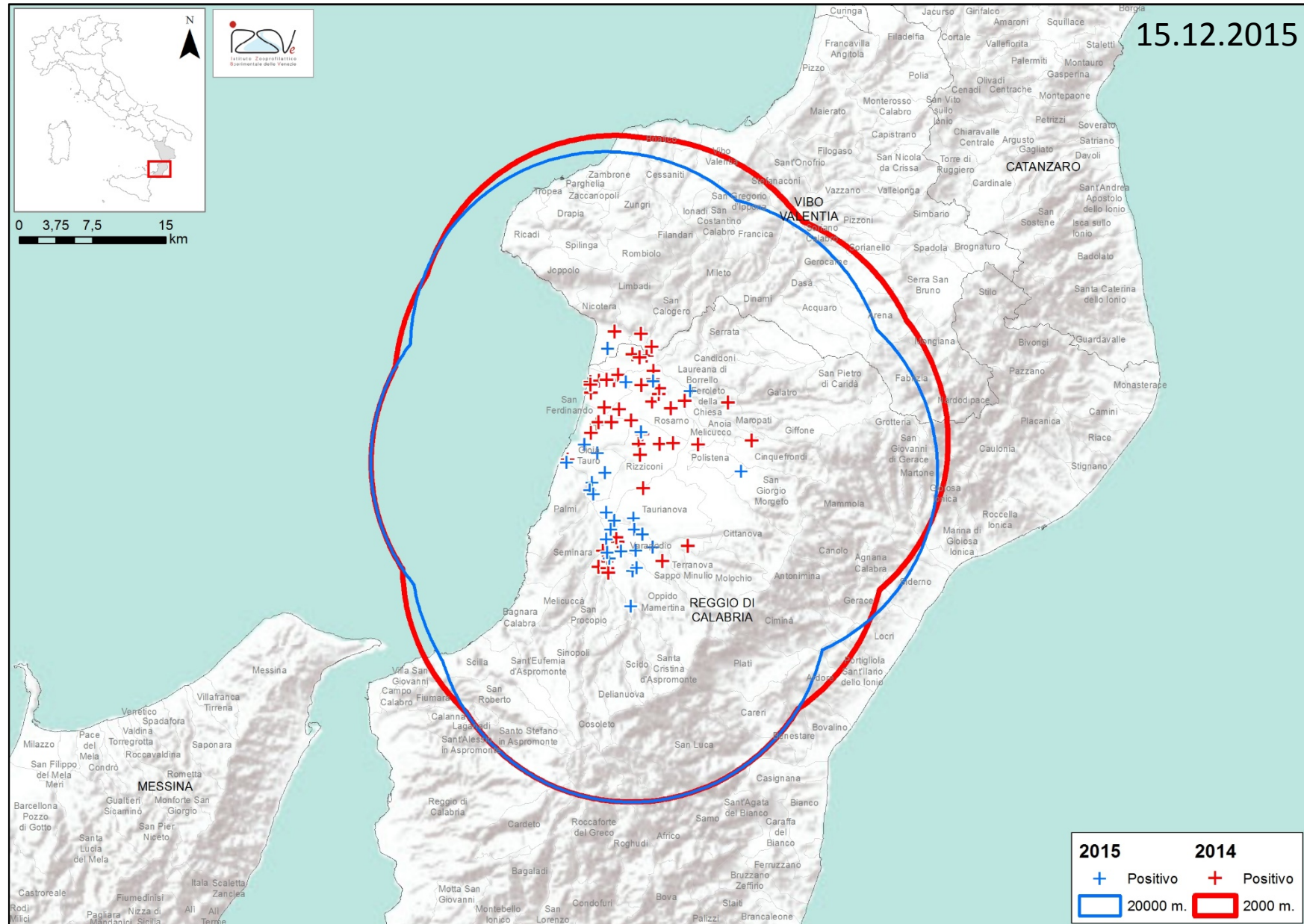
One apiary in Oppido Mamartina municipality
60 swarms (27.04.15)



The situation as of 31 December 2015: 29 infested apiaries



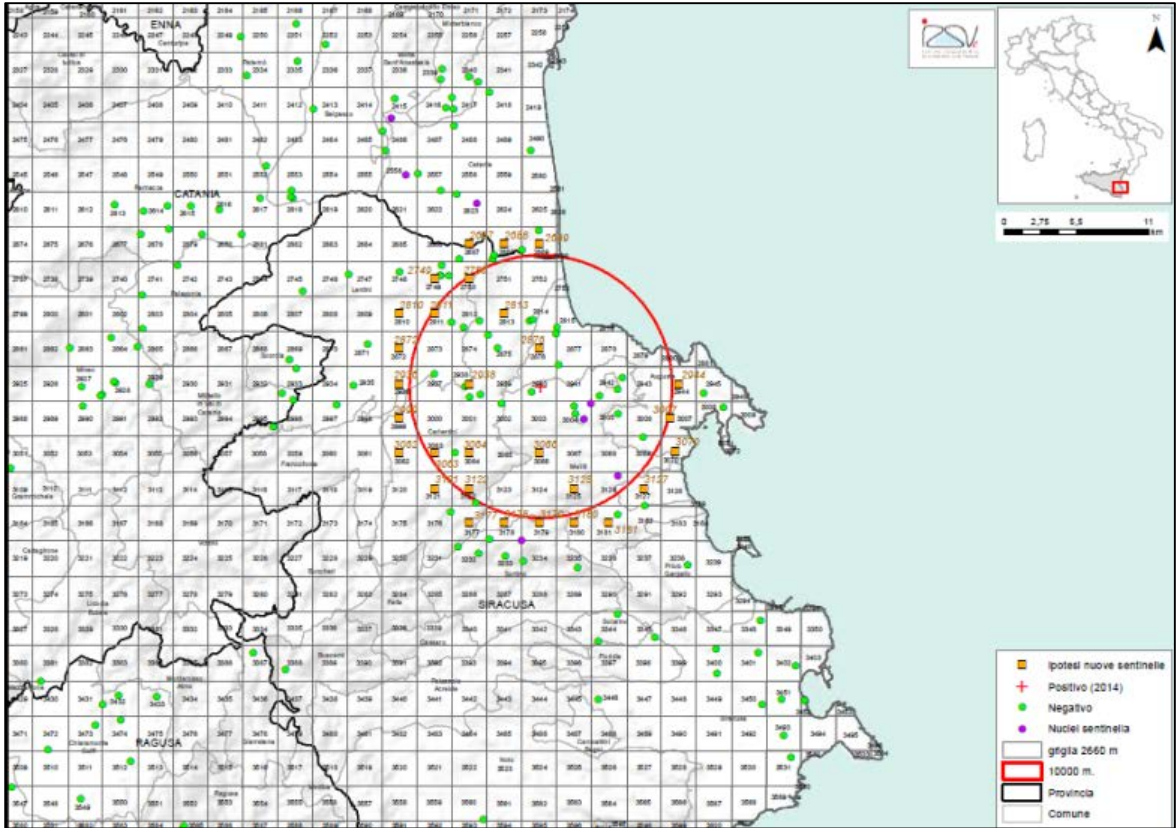
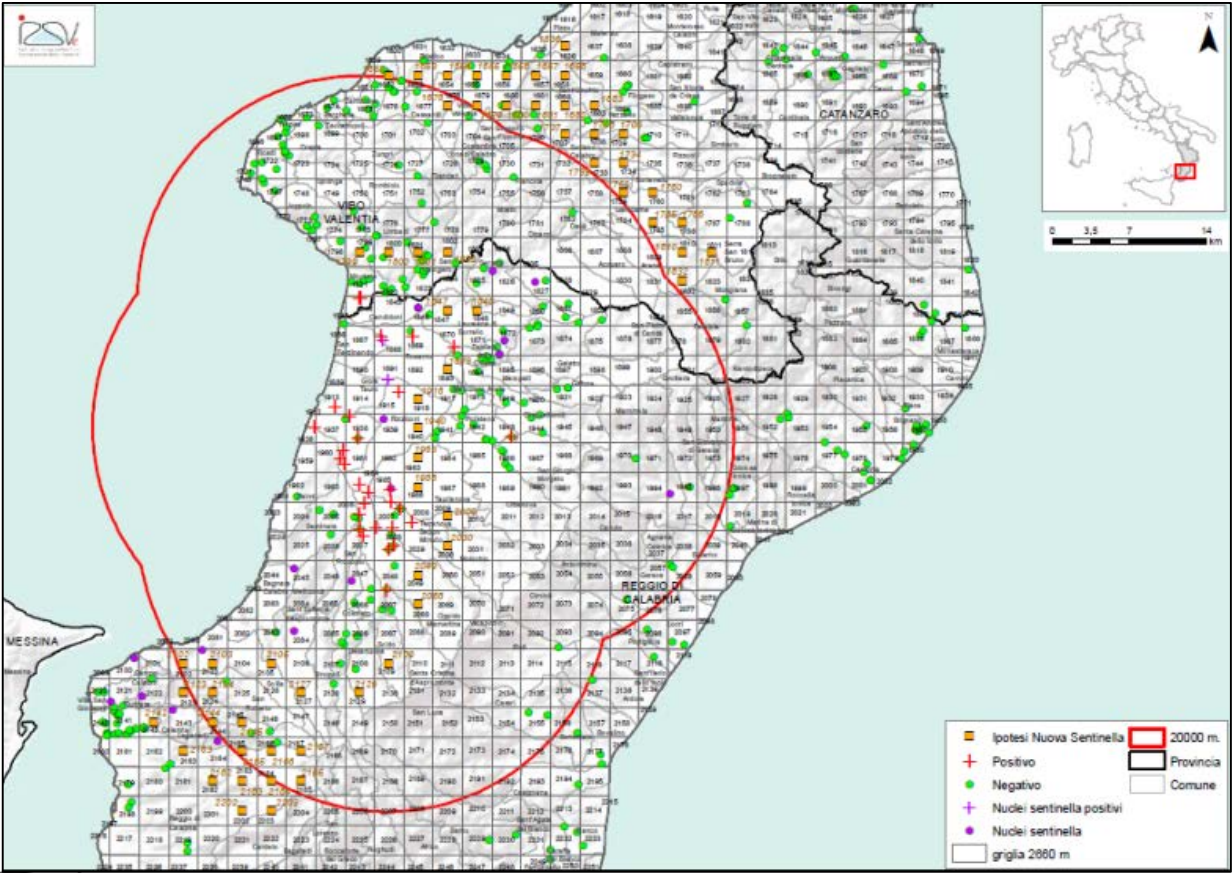
Comparison between 2014 (red) e 2015 (blu) infested apiaries



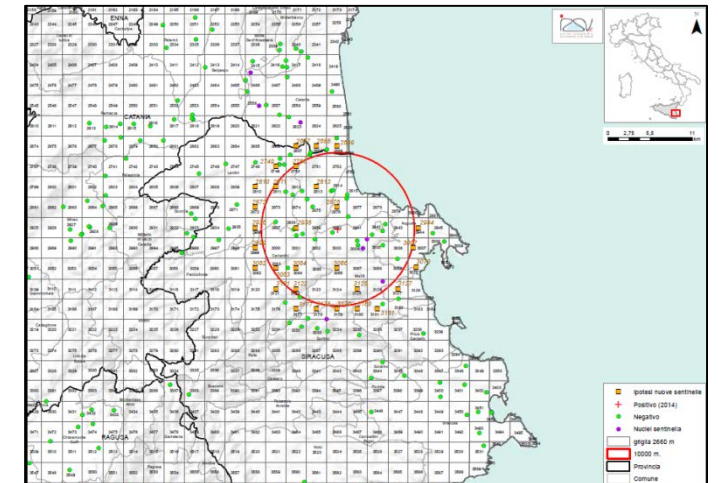
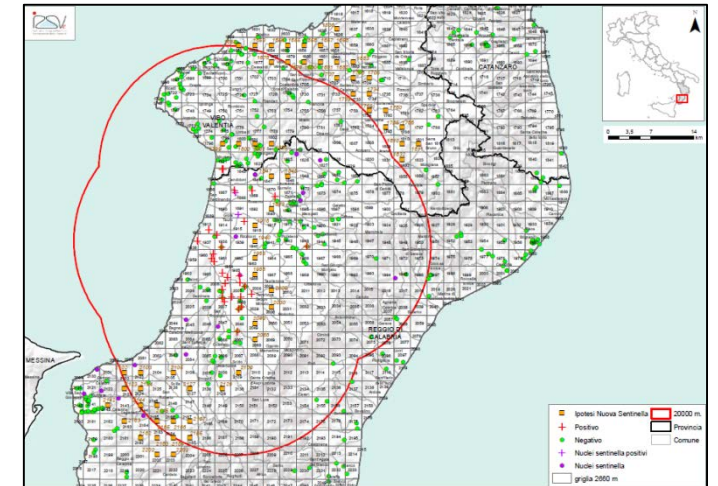
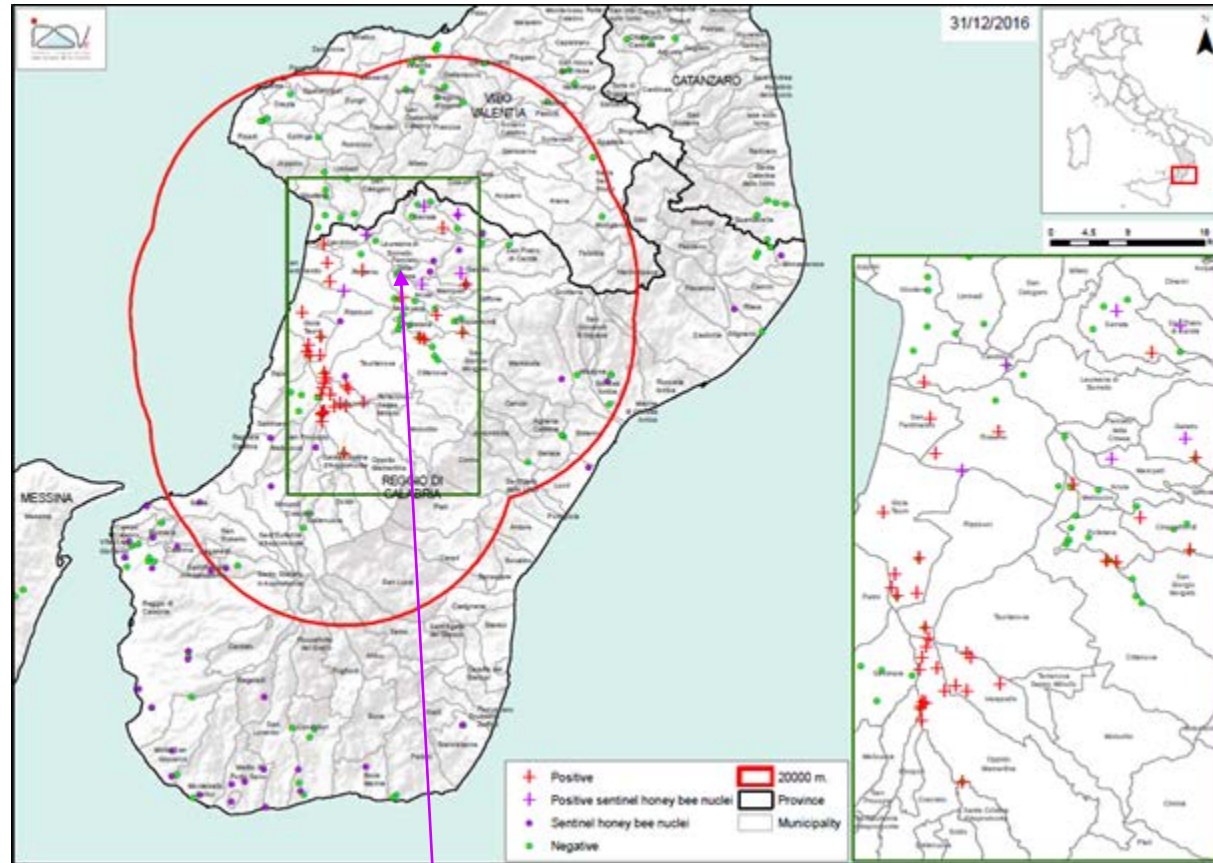
SHB surveillance program - Italy - 2016

Territory	Epidemiological units	N. apiaries	N. hives for apiary
Italy (excluded Calabria and Sicily)	Northern	177 non migratory random selected (2% expected prevalence CI 95%)	2% expected prevalence CI 95%
	Central	170 non migratory random selected (2% expected prevalence CI 95%)	2% expected prevalence CI 95%
	Southern	163 non migratory random selected (2% expected prevalence CI 95%)	2% expected prevalence CI 95%
Region	Territory/zones	N. apiaries	N. hives for apiary
Sicily	Catania Siracusa Ragusa	134 non migratory random selected (2% expected prevalence CI 95%)	5% expected prevalence CI 95%
	rest of territory	198 non migratory random selected (2% expected prevalence CI 95%)	5% expected prevalence CI 95%
Region	Territory/zones	N. apiaries	N. hives for apiary
Calabria	protection zone	53 apiaries	5% expected prevalence CI 95%
	surveillance zone + the rest of territory	147 random (2% expected prevalence CI 95%)	5% expected prevalence CI 95%

Region of Calabria and Sicily: sentinel honey bee nucleus colonies



Calabria region: April-December 2016



6 honey bee sentinel units (2 nucleus colonies each) have been found infested by SHB adults

New SHB incident on 25-28 July 2016 in the province of Cosenza (Calabria region)

An unregistered beekeeper, 6 apiaries

4 infested apiaries destroyed (128 colonies)

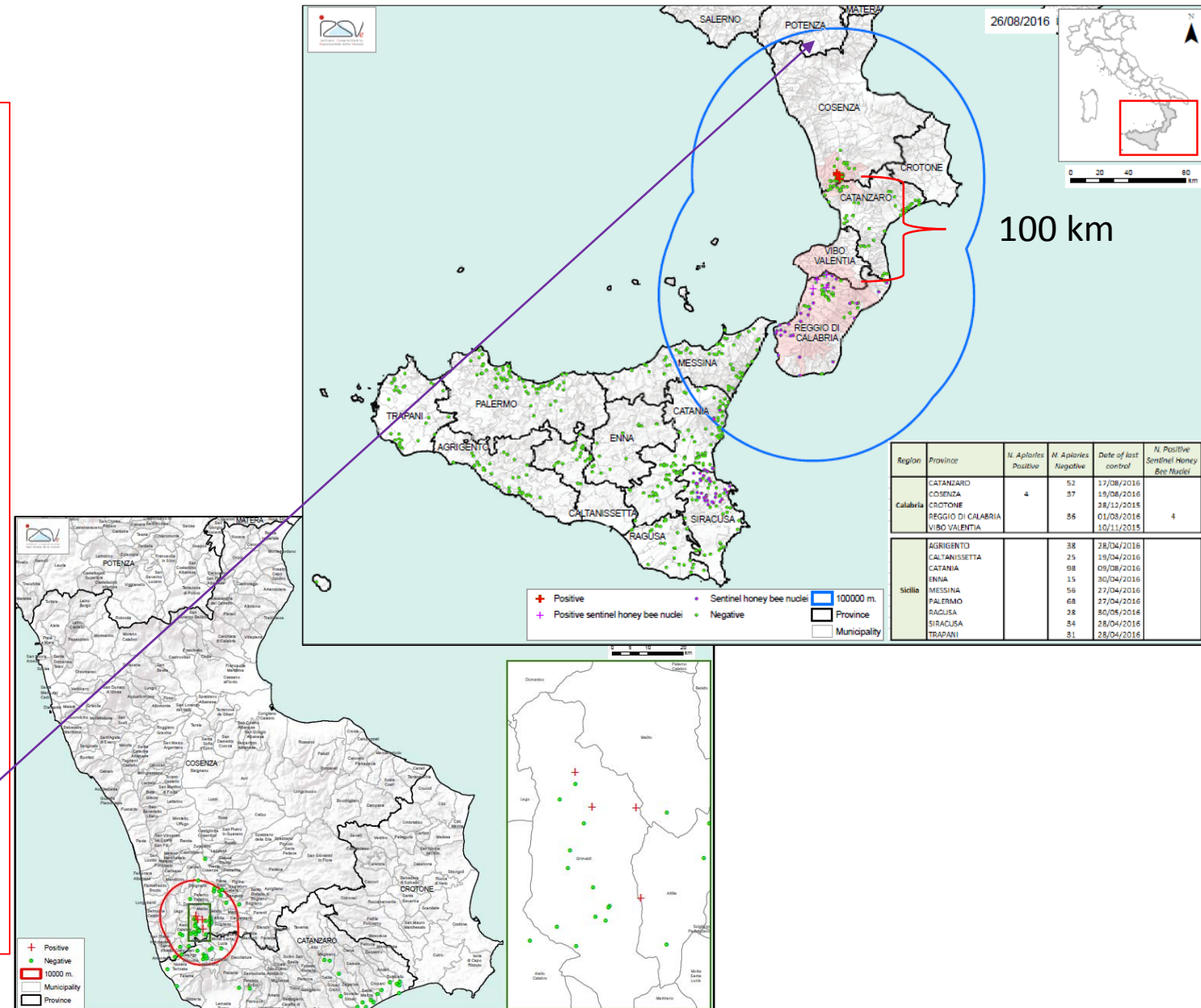
2 negatives still alive (115 colonies)

On 12/9, 1 apiary found infested and destroyed (70 colonies)

Protection zone = 10 km

Surveillance zone = the whole territory of the Calabria region

Potenza province, Basilicata region: Directive 92/65/EEC



Province of Cosenza (Calabria region)

Protection zone of 10 km radius:

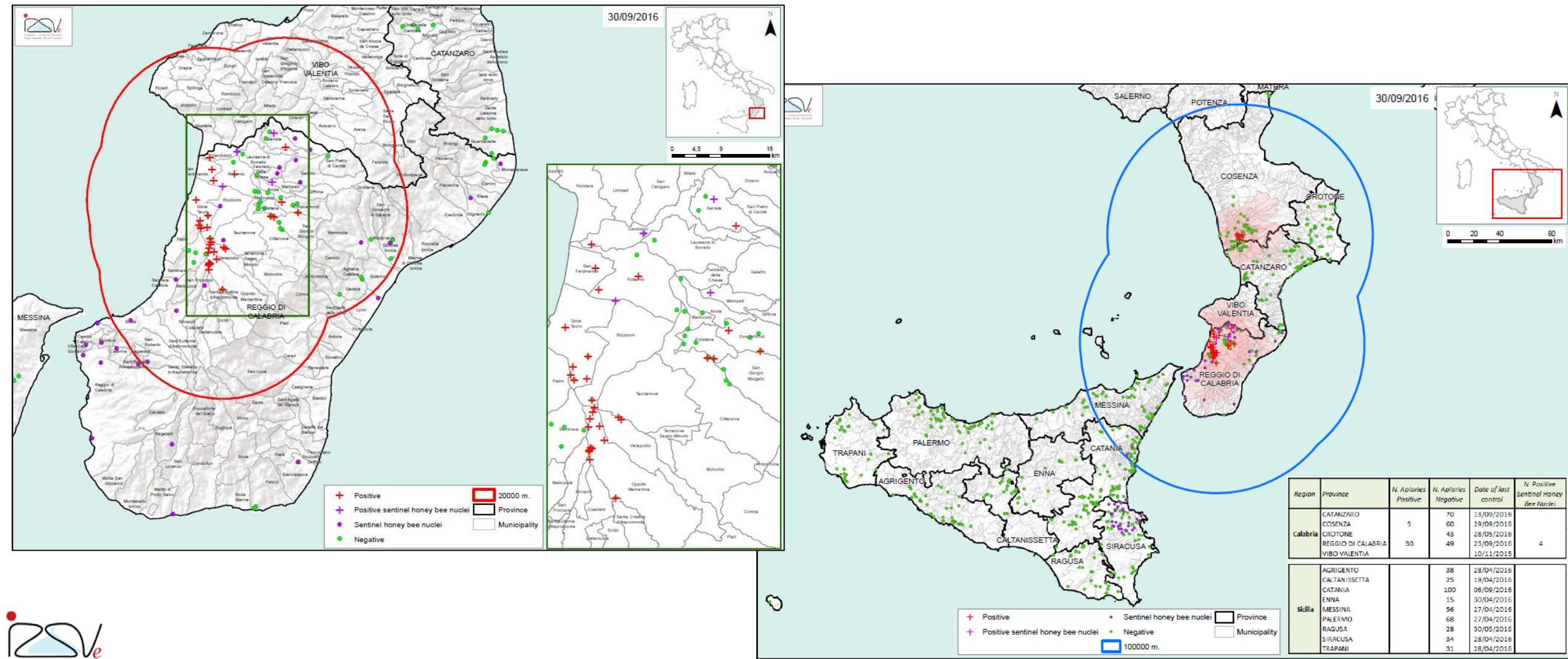
- determined according with the characteristics of the outbreak as was done in Sicily
- easy to be managed
- intensive surveillance in a radius of 1 km around the first outbreak
- less workload for official veterinarians
- more precise inspection activity
- less impact on beekeepers activity (movement restriction)
- collaboration among different competent authorities (vet services, national forest corp, police)

Real time PCR on hive debris

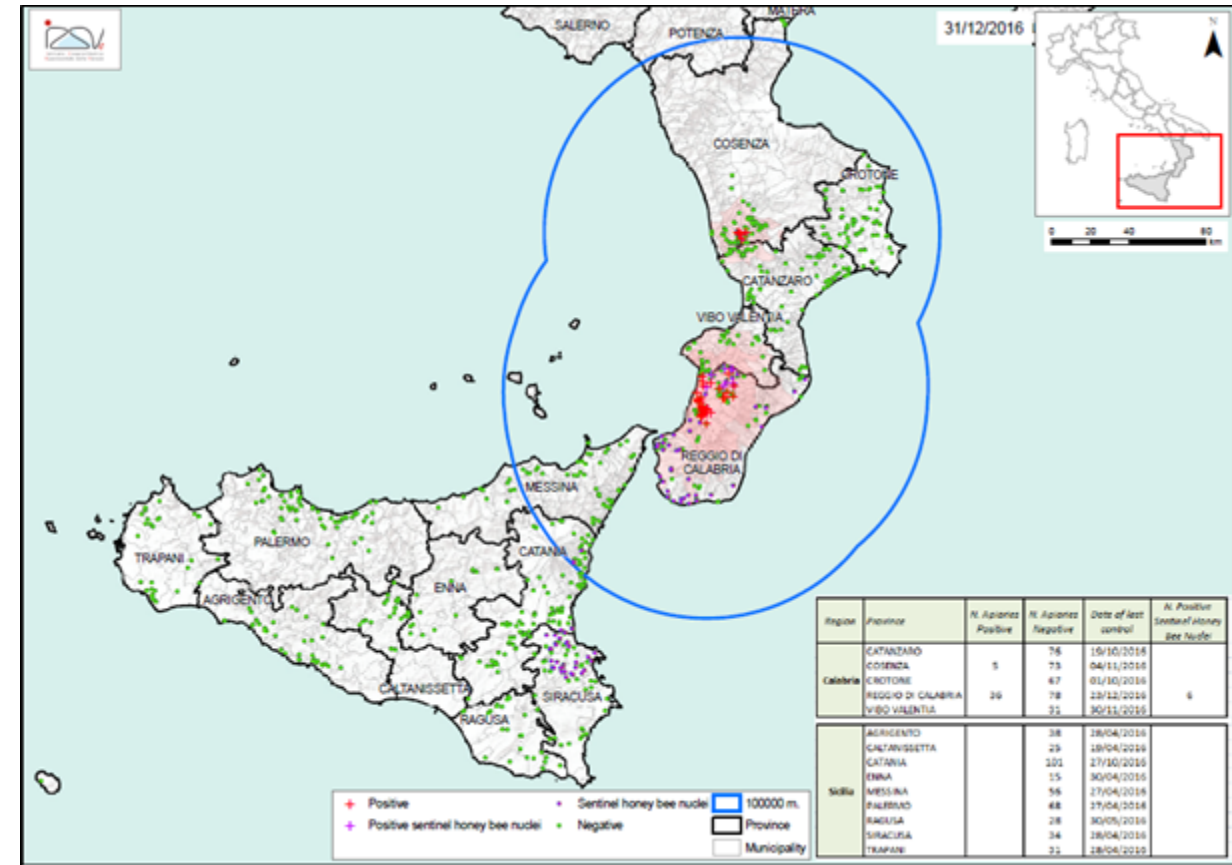
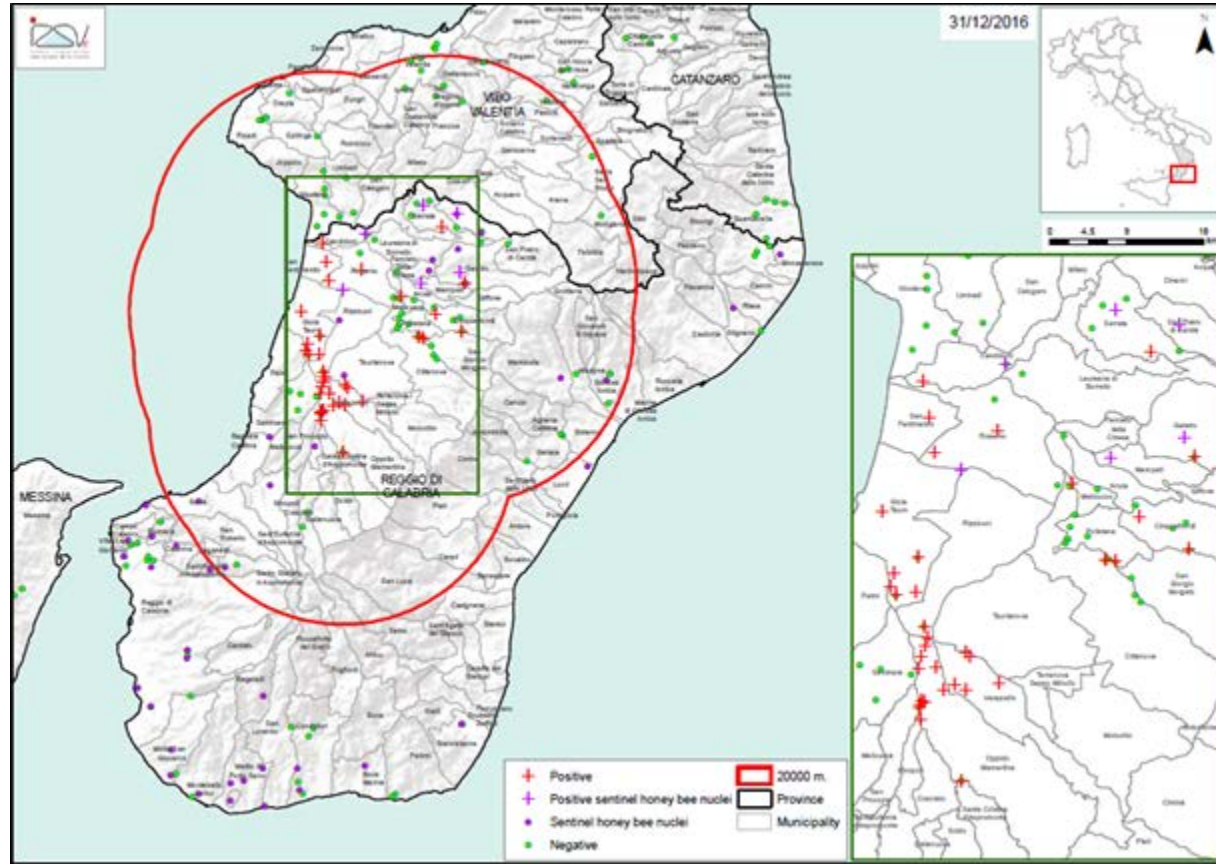
Real time PCR (Ward et al., 2007)

- Applied to hive debris in the province of Cosenza
- SHB infested and non-infested apiaries
- Accredited
- The application in the framework of a surveillance program under evaluation

The situation as of 30 September 2016: 30 infested apiaries notified by beekeepers (13-23 September)



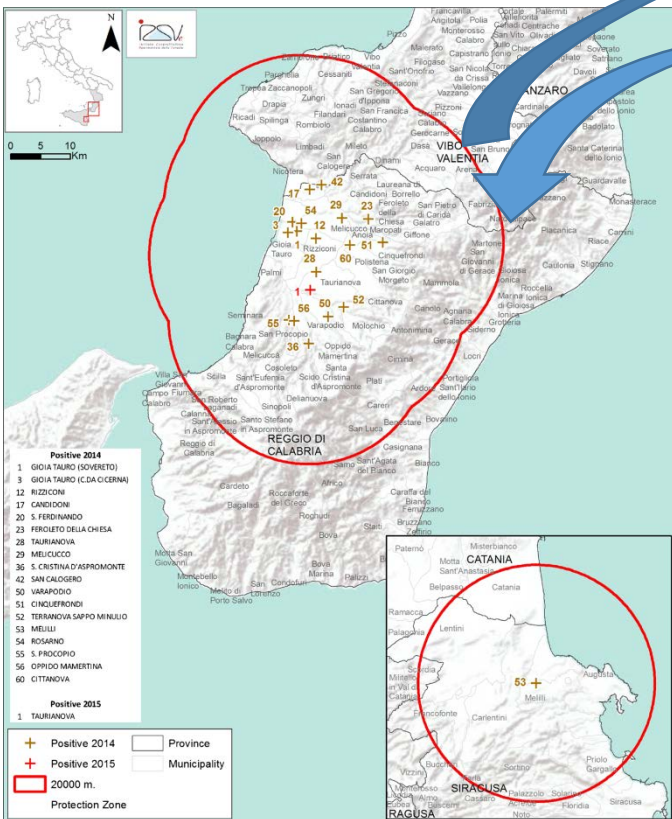
The situation as of 31 December 2016: 40 infested apiaries and 1 swarm



Aethina tumida: phylogenetic analysis

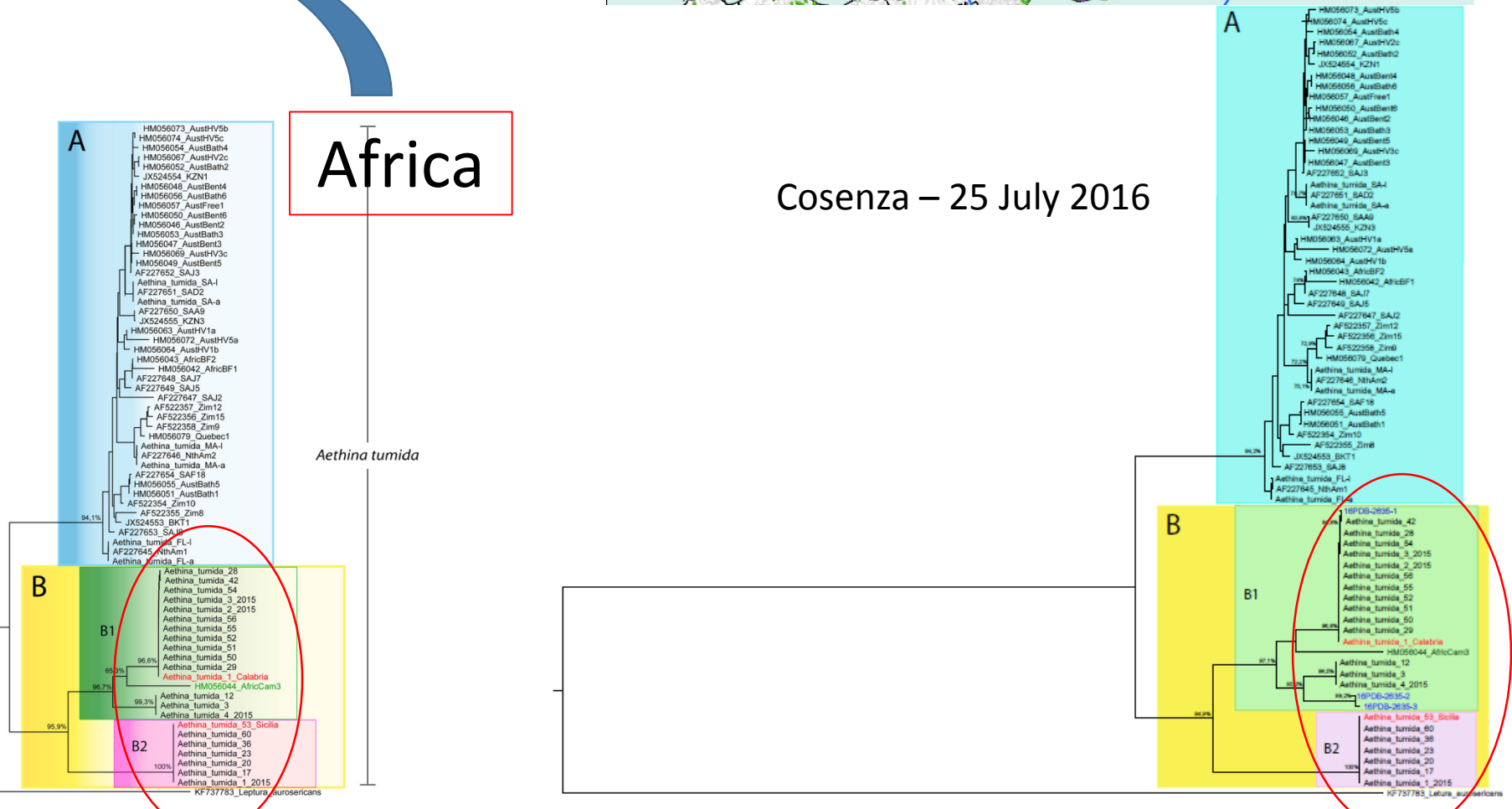
(Granato et al., 2016)

Reggio Calabria – 2014 and 2015



Africa

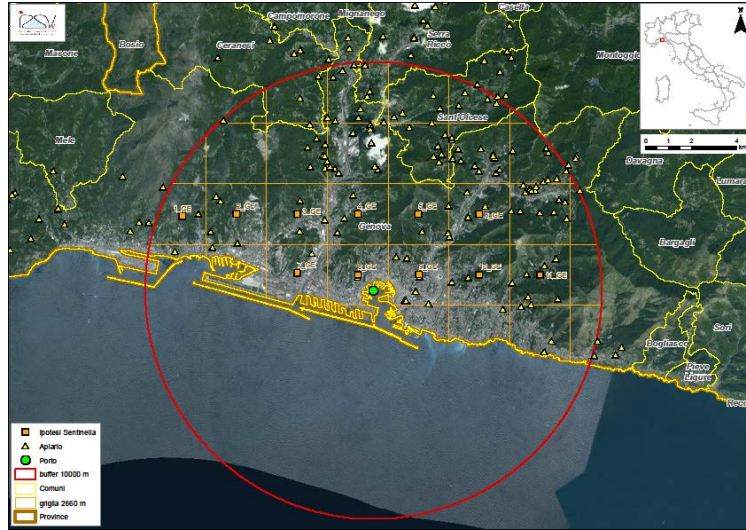
Cosenza – 25 July 2016



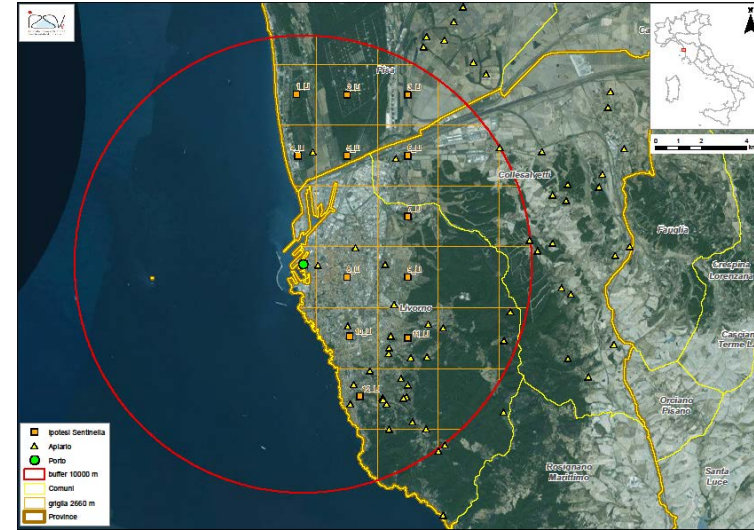
SHB surveillance program - Italy - 2017

Territory	Epidemiological units	N. apiaries	N. hives for apiary
Italy (excluded Calabria and Sicily)	Northern	164 non migratory random selected (2% expected prevalence CI 95%)	2% expected prevalence CI 95% (90% se, 100% sp)
	Central	164 non migratory random selected (2% expected prevalence CI 95%)	2% expected prevalence CI 95%
	Southern	164 non migratory random selected (2% expected prevalence CI 95%)	2% expected prevalence CI 95%
Region	Territory/zones	N. apiaries	N. hives for apiary
Sicily	Catania Siracusa	164 non migratory random selected (2% expected prevalence CI 95%)	5% expected prevalence CI 95%
	Ragusa		
	Rest of territory	164 non migratory random selected (2% expected prevalence CI 95%)	5% expected prevalence CI 95%
Region	Territory/zones	N. apiaries	N. hives for apiary
Calabria	Protection zones	Sentinel nucleus colonies/86 apiaries	5% expected prevalence CI 95%
	Rest of territory	160 random (2% expected prevalence CI 95%)	5% expected prevalence CI 95%

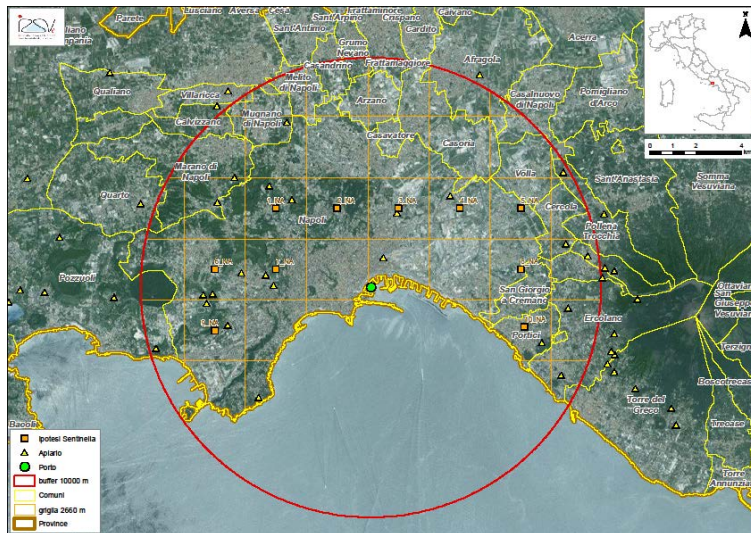
National surveillance plan 2017 – sentinel nucleus colonies: ports with import of wood from Africa



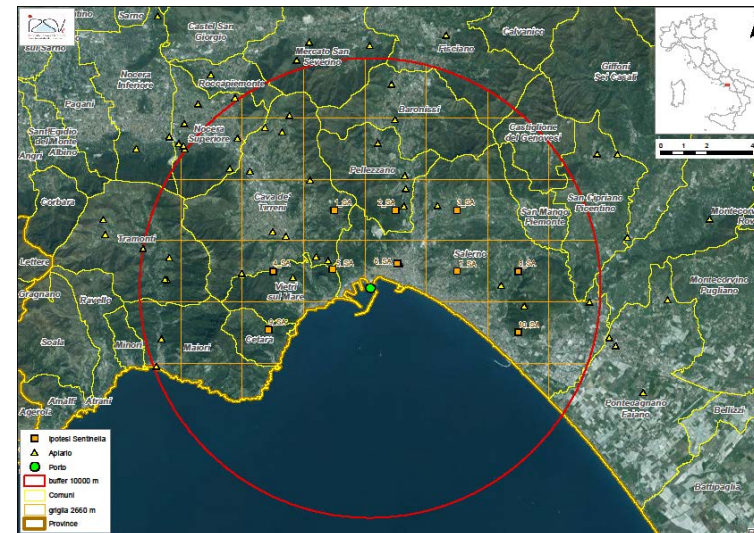
Genova



Livorno



Napoli



Salerno

Traps

In general traps posed some problems.

- Only rarely beetles were found in the Better Beetle Blaster type traps
- Diagnostic traps (corrugated plastic sheet, Schäfer type) were rarely able to capture beetles
- In addition, this type of trap was very soon propolised by the bees
- Better Beetle Blaster traps are propolised too but it takes longer
- In addition, the hot temperature of summer 2015 strongly affected Schäfer type traps; they became curve and could not adhere anymore to the hive bottom board

Aethina tumida – differential diagnosis

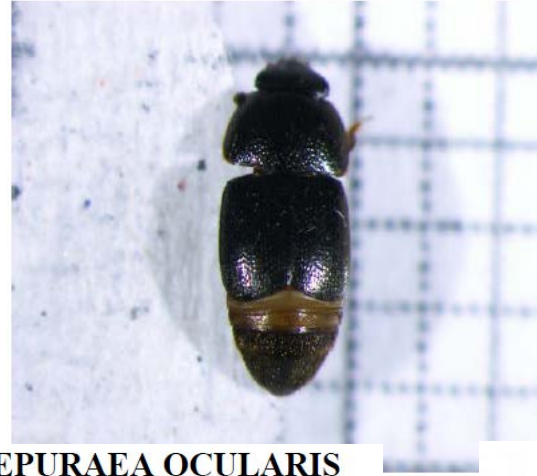
STELIDOTA GEMINATA



CARPOPHILUS SPP.



COLOPTERUS ABDOMINALIS



EPURAEA OCULARIS



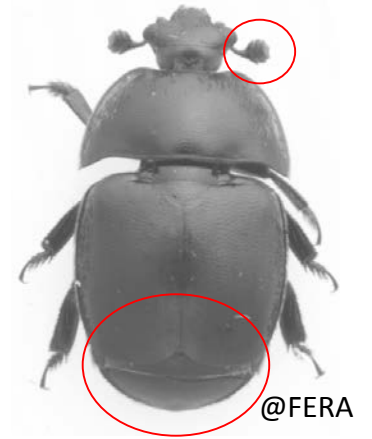
EPURAEA LUTEOLA



CARPOPHILUS NEPOS



CARPOPHILUS MUTILATUS



@FERA

UROPHORUS HUMERALIS



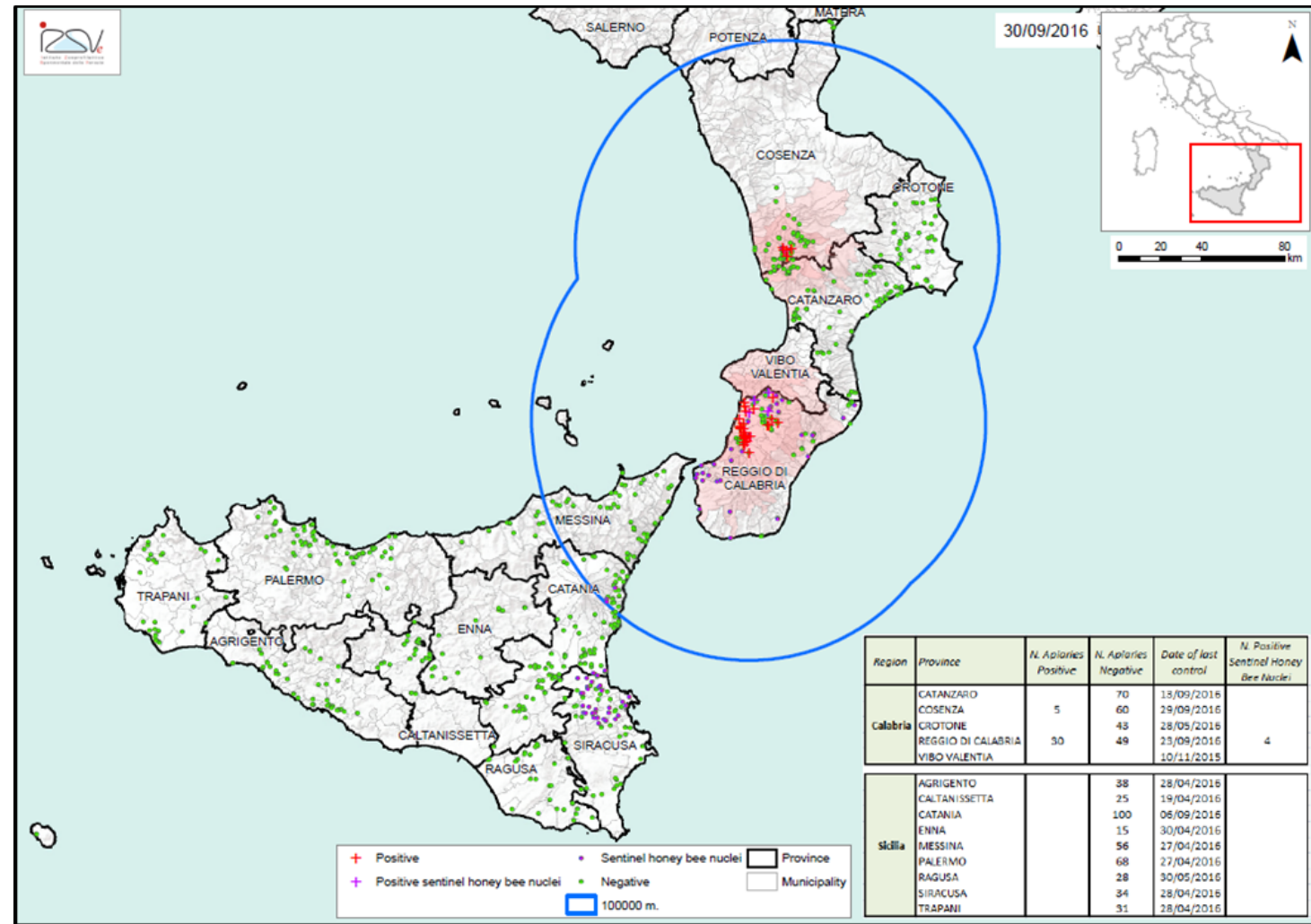
(Mutinelli et al., 2015)

Calabria: December 2014 – January 2015, July 2015, December 2016: beetles collected on rotting Citrus and lime

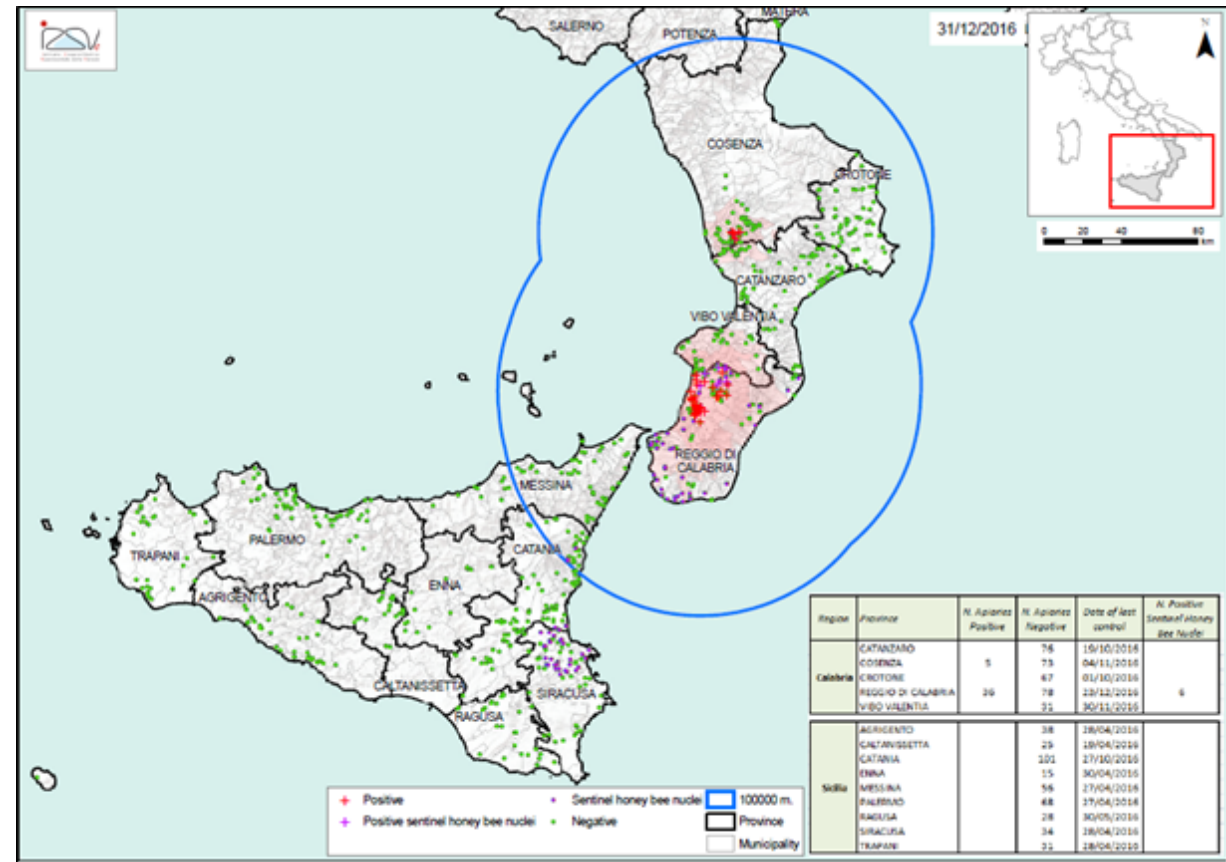
Conclusions

SHB occurrence:

- ✓ Calabria 2014, Reggio Calabria and Vibo Valentia provinces
- ✓ Calabria 2015, Reggio Calabria and Vibo Valentia provinces
- ✓ Calabria 2016, Reggio Calabria province – **sentinel** honey bee nuclei and apiaries,
- ✓ **Cosenza** province
- ✓ Sicily 2014, Siracusa province – one infested apiary
- ✓ Potenza province (part of) under Directive 95/62/EEC

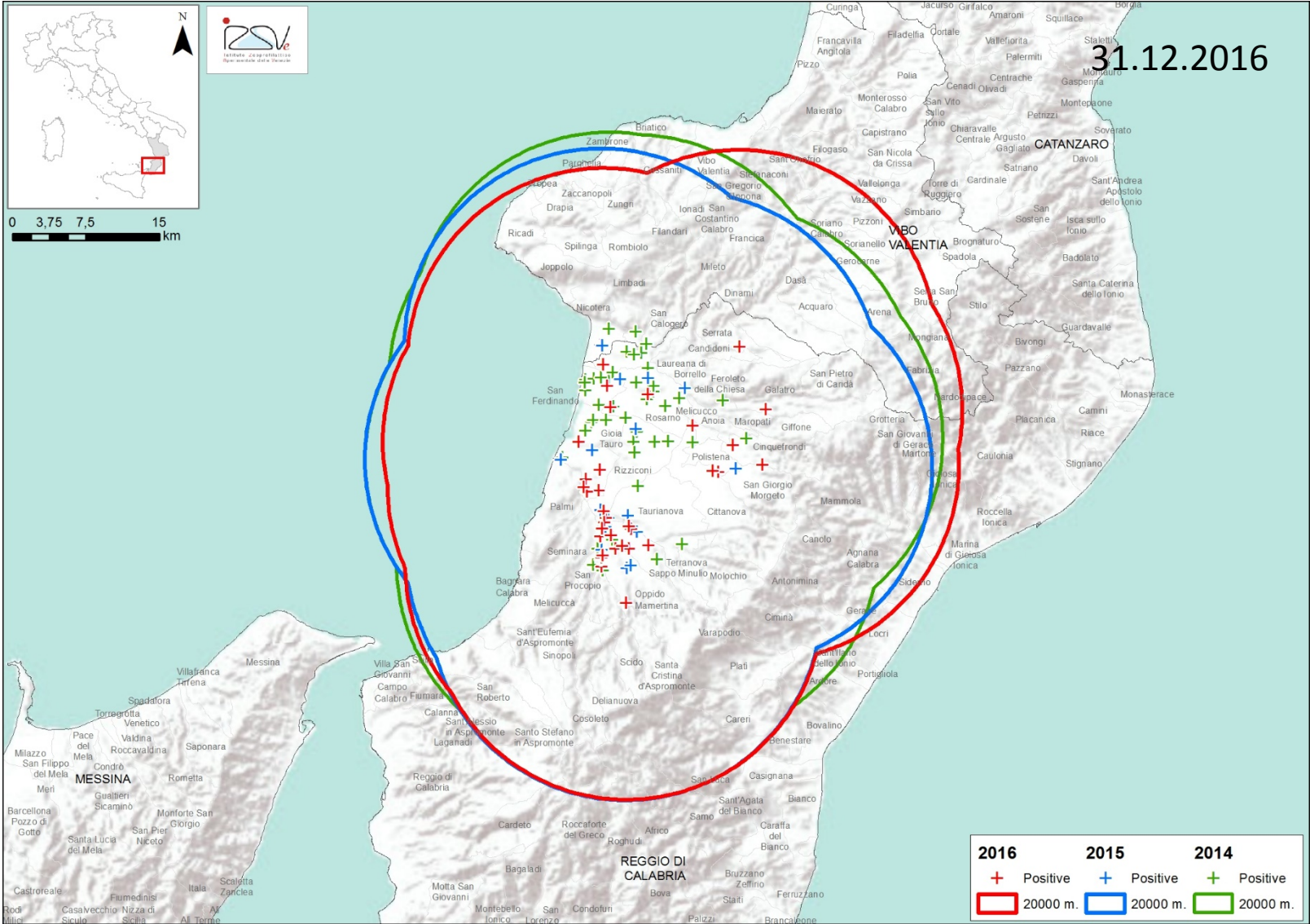


Perspectives - Calabria

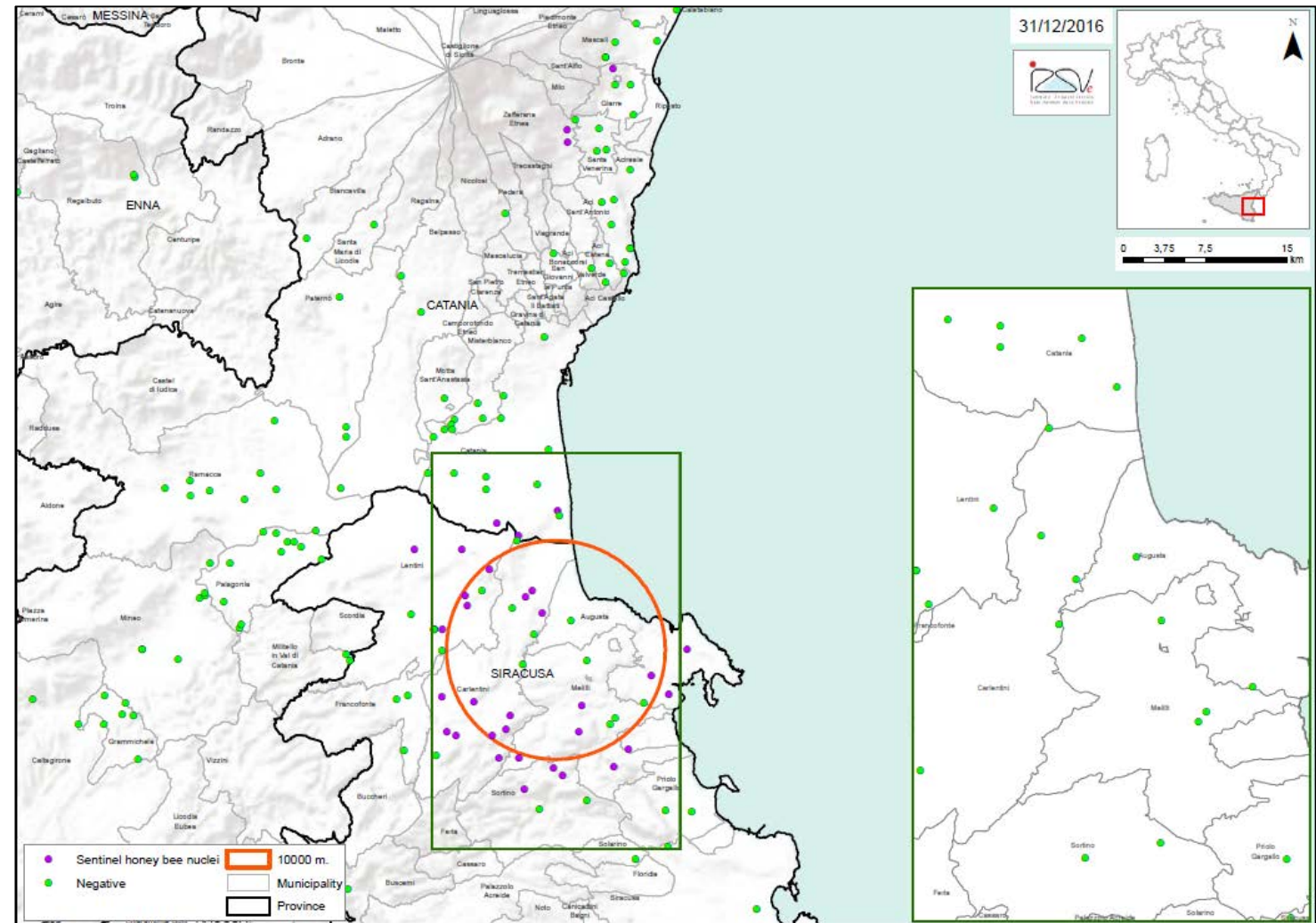


- ✓ Protection zone = 20 km (provinces of Reggio Calabria and Vibo Valentia)
- ✓ Protection zone = 10 km (province of Cosenza)
- ✓ Surveillance zone = the whole territory of the region
- ✓ Increase the number of sentinel nucleus colonies in and around the protection zone

Comparison between location of 2014 (green), 2015 (blue) and 2016 (red) infested apiaries



Perspectives - Sicily



- ✓ The protection zone has been removed after 2 years without any detection of SHB (December 2016)
- ✓ Surveillance activity based on sentinel nucleus colonies (in and around the former protection zone) and in the rest of the regional territory based on randomly selected apiaries



Thank you for your attention

<http://www.izsvenezie.com/aethina-tumida-in-italy/>