

Halyomorpha halys

(Hemiptera: Pentatomidae)

in Chile



Gobierno
de Chile

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The beginning of the history of Halyomorpha in Chile

...it all started in 2010

The New York Times

Move Over, Bedbugs: Stink Bugs Have Landed



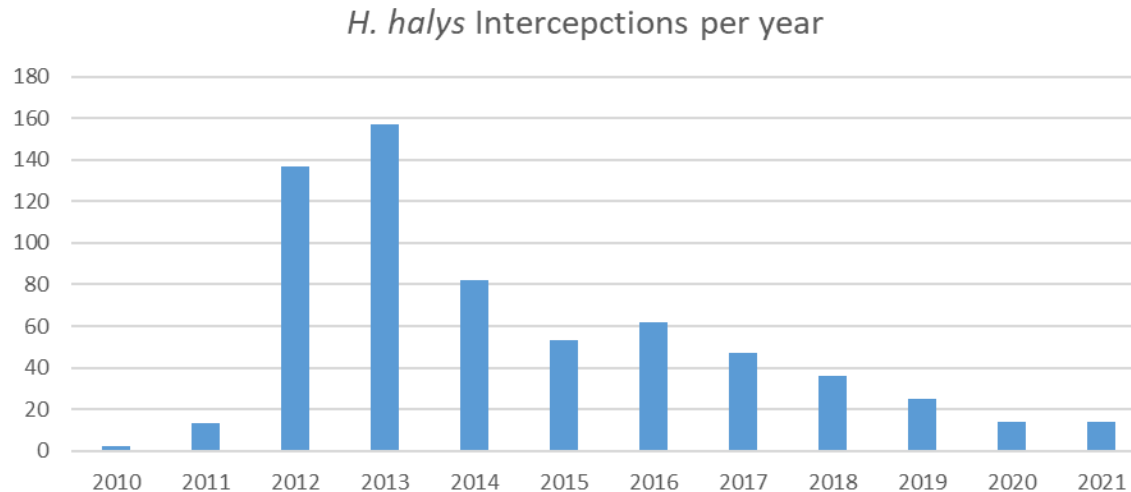
Kelli Wilson and her father, Richard Lee Pry, cleared stink bugs from her porch Friday in Burkittsville, Md. The shield-shaped invaders have damaged fruit and vegetable crops. Steve Ruark for The New York Times

By Ken Maguire

Sept. 26, 2010

Evolution of *H. halys* interceptions in Chile

That same year, the first interception was registered at a port of entry in our country.

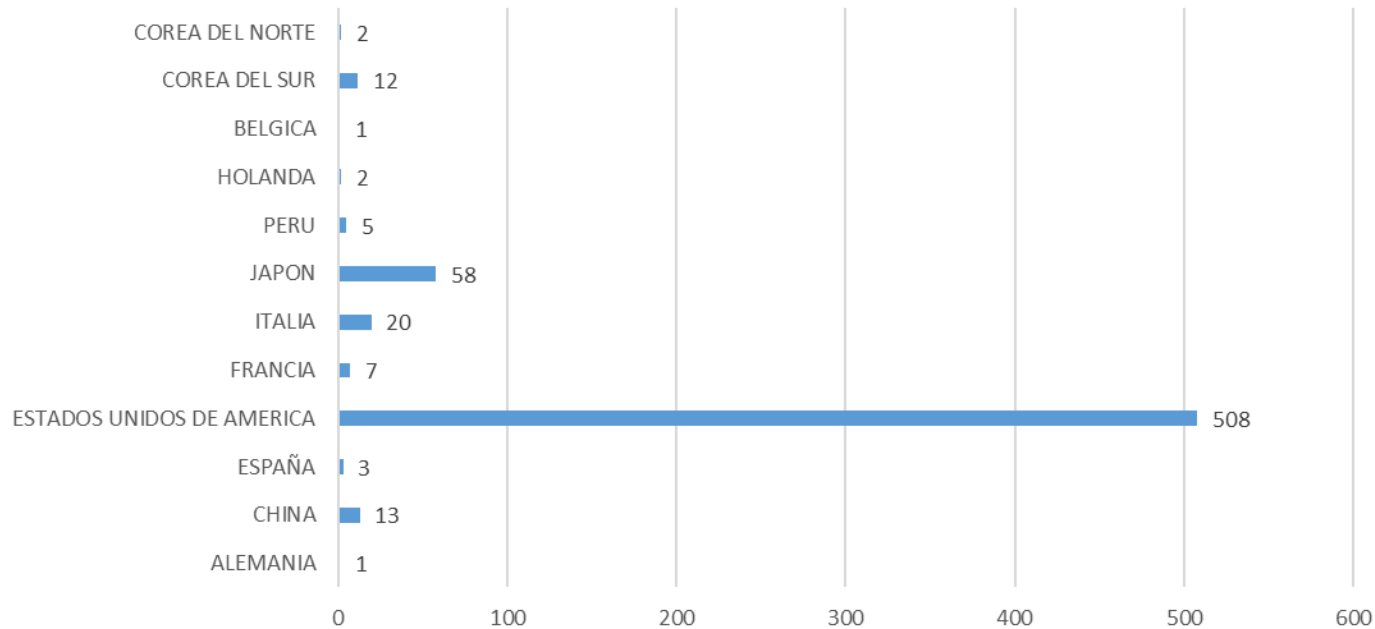


- PRA was carried out (2011) and *H. halys* was declared as a quarantine pest
- Res. N° 6319/2013 was issued to regulate products (fumigation) mainly coming from the U.S.A. later modified in 2017 and again in 2018.

What is the origin of the *H. halys* intercepted in Chile?

- Most of the specimens come from the USA and Asia
- Europe as become important as well.

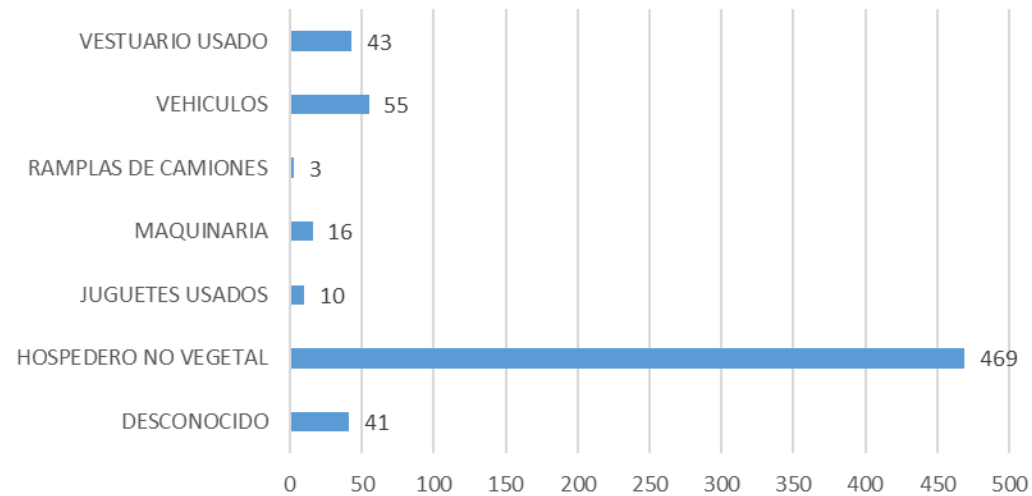
H. halys Interceptions per country of origin 2010-2021



How does Halyomorpha enter Chile?

In a wide variety of non-agricultural products

H. halys Interceptions per product



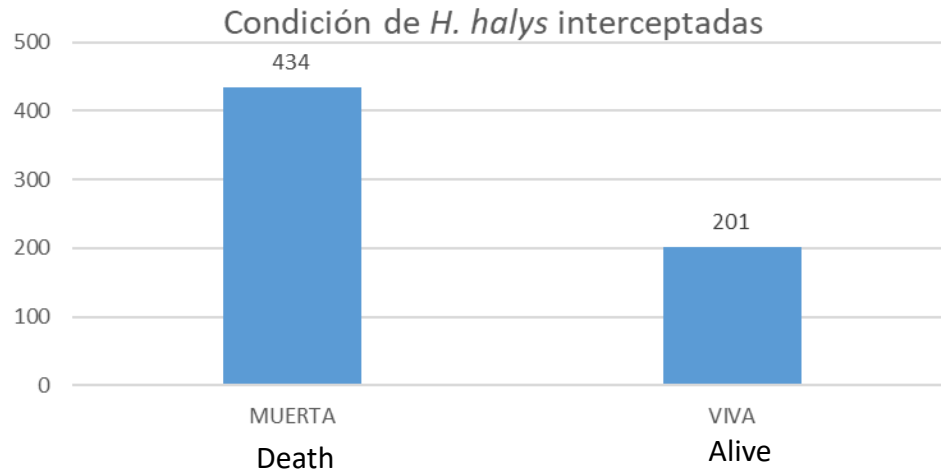
Containers with used clothes



containers with used cars and auto parts

Are the interceptions of live or dead insects?

both of them



From USA in
used cloth



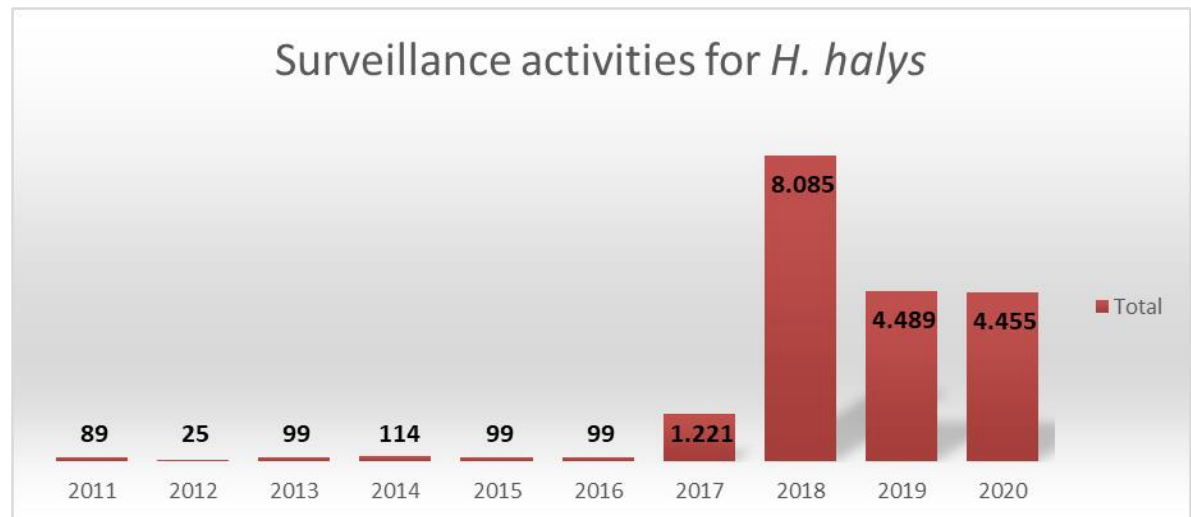
From Italy in
furnitures



A national surveillance program was implemented to detect this pest

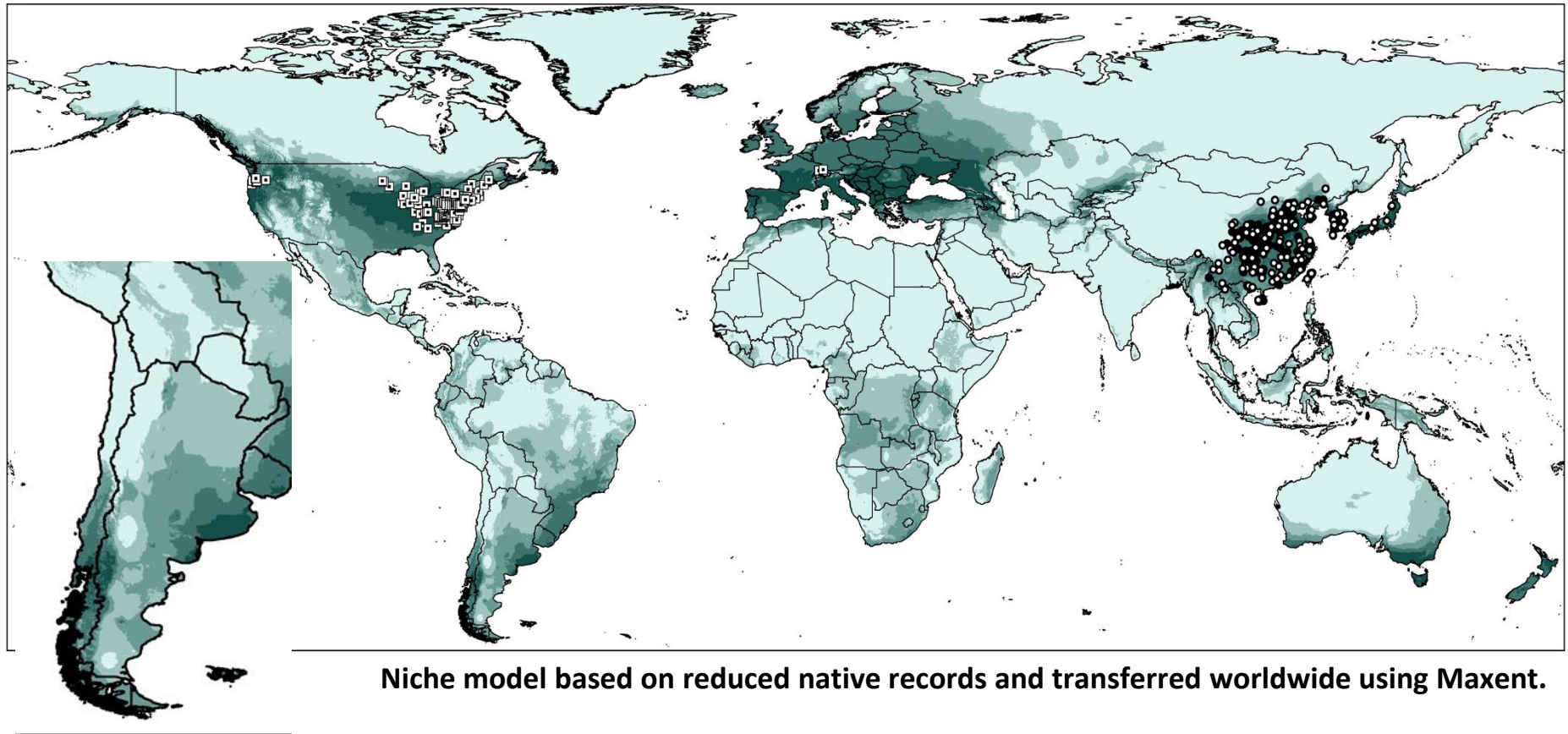
In 2011 the first living individual was detected in Chilean territory not associated with an imported product:

- Emergency Surveillance Plan was carried out. No further specimens were detected so we assumed it was a interception
- A small national surveillance plan for this pest was started: first in the two most risky regions (Tarapacá in northern Chile and in Santiago) to gradually add Regions.



Should we be worried?

Potential distribution (Maxent bioclimatic modeling)



Zhu G, Bu W, Gao Y, Liu G (2012) Potential Geographic Distribution of Brown Marmorated Stink Bug Invasion (*Halyomorpha halys*). PLOS ONE 7(2): e31246. <https://doi.org/10.1371/journal.pone.0031246>
<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0031246>

Areas under risk

Potential distribution (Maxent bioclimatic modeling)

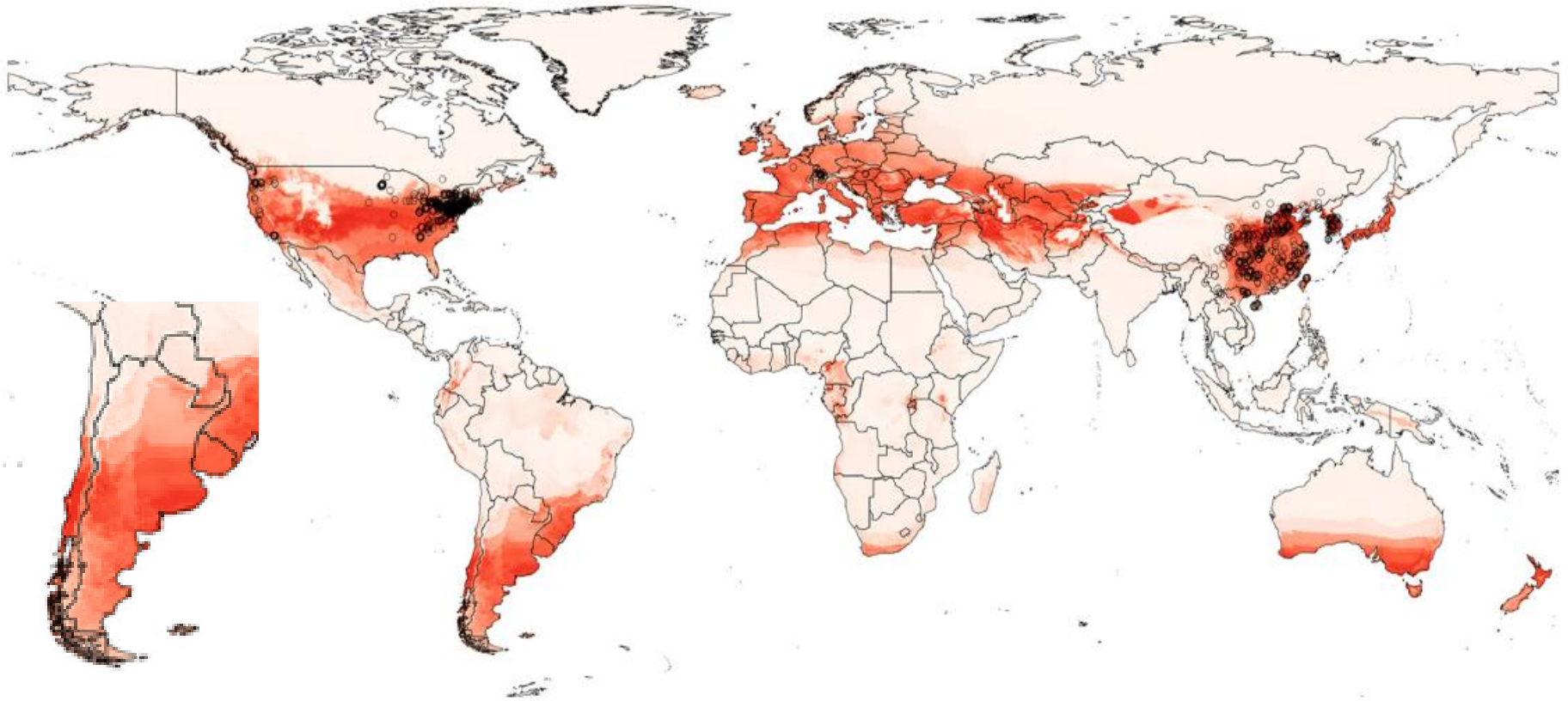


Fig. 1 Current world distribution of *Halyomorpha halys* (circles) and bioclimatic model (Maxent software, <http://www.cs.princeton.edu/~schapire/maxent/>) based on distribution data in Asia. Dark colour

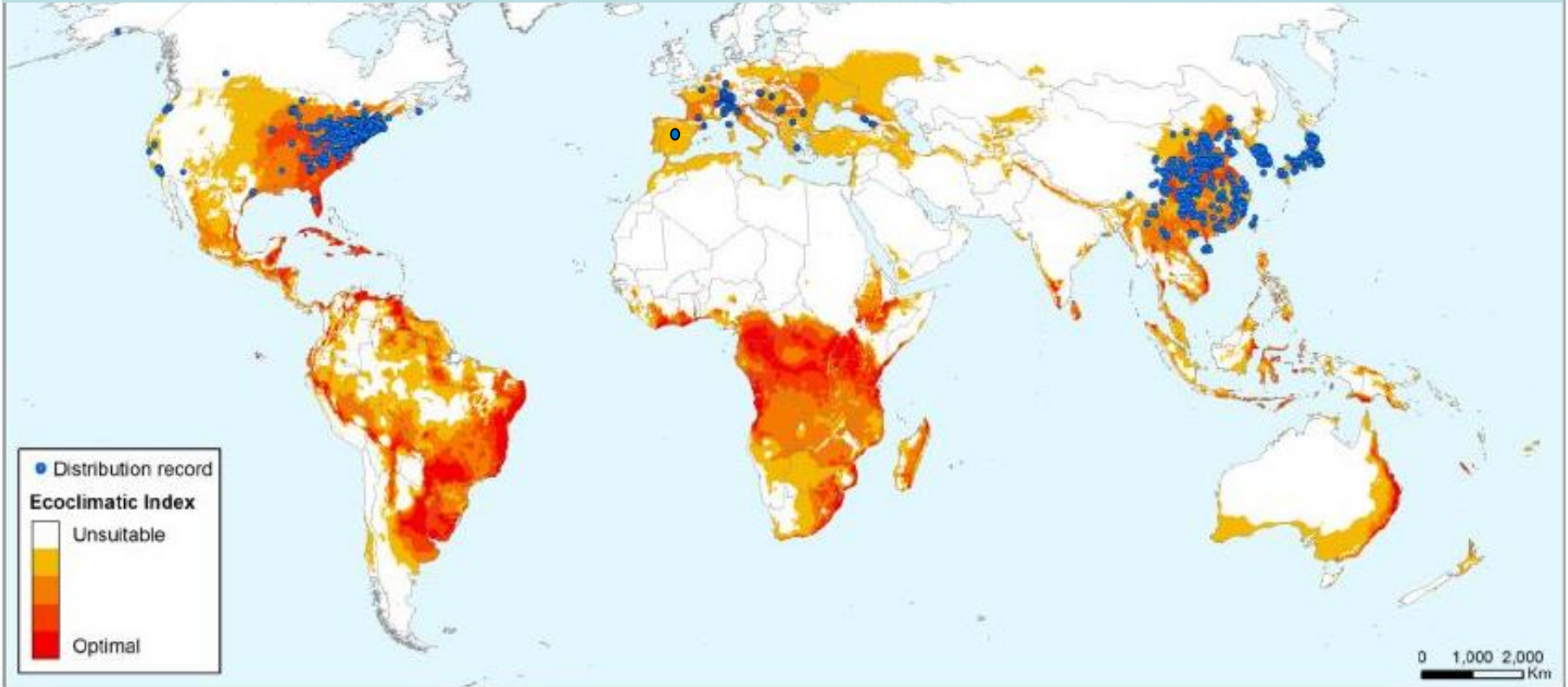
represents high habitat suitability; light colour indicates low suitability (Rossi and Streito, unpublished). Background map from <http://www.natureearthdata.com>

Haye, T., T. Garipey, K. Hoelmer, J. P. Rossi, J. C. Streito, X. Tassus, and N. Desneux. 2015. Range expansion of the invasive brown marmorated stink-bug, *Halyomorpha halys*: An increasing threat to field, fruit and vegetable crops worldwide. *J. Pest Sci.* 88: 665–673

Current and potential distribution (Maxent bioclimatic model)



Kriticos, Kean, Phillips, Senay, Acosta, Haye (2017) The potential global distribution of the brown marmorated stink bug, *Halyomorpha halys*: A critical threat to plant biosecurity. *Journal of Pest Science* (<https://doi.org/10.1007/s10340-017-0869-5>)



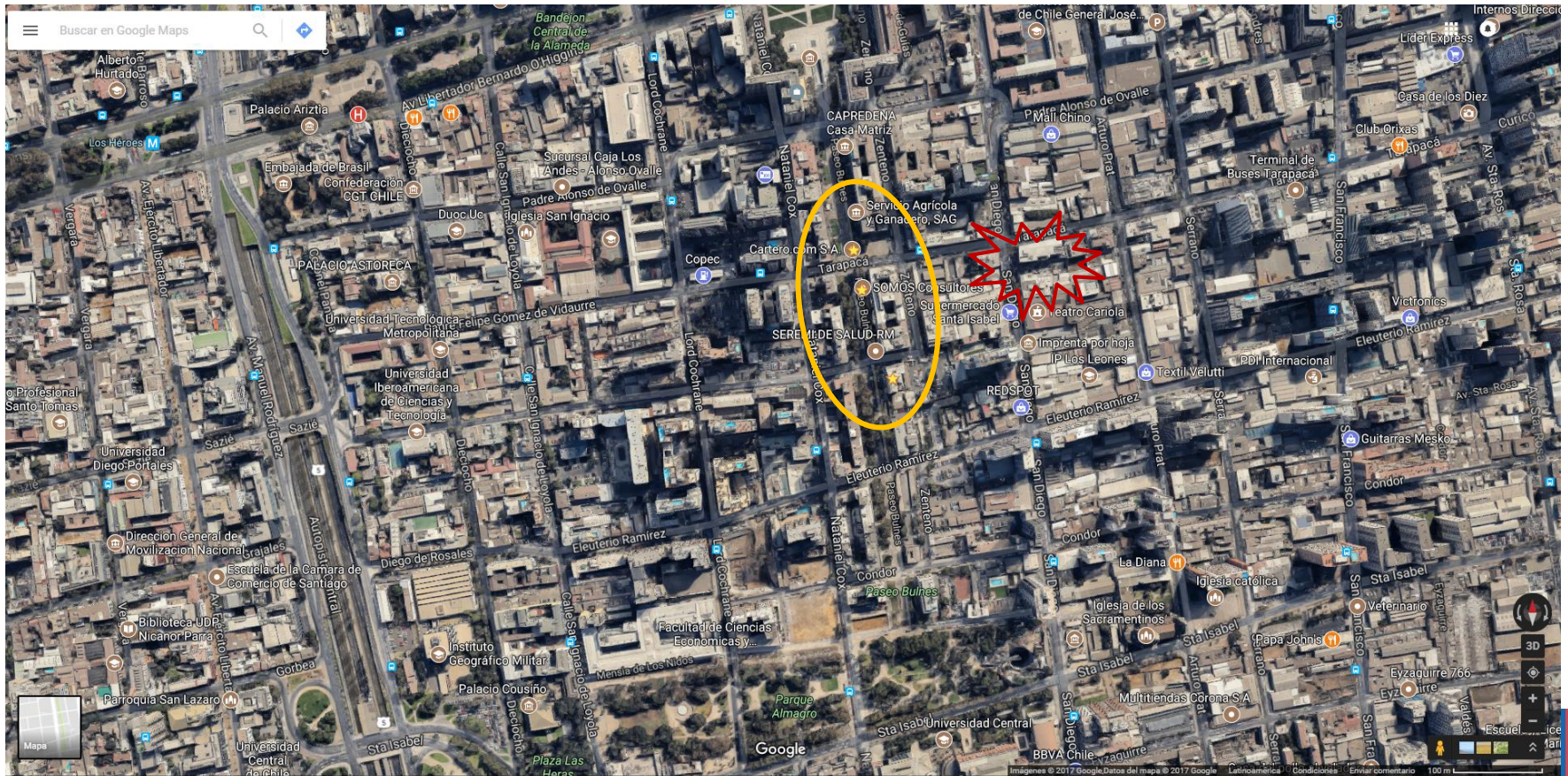
2015: in land detections



Notification of Hh made by the company Ursus Trotter found in furnaces imported from China.

An other Detection area is broadened to Downtown Santiago

At the same time, complaints were received from adults detected right in front of the SAG headquarters, right next to a Chinese mall.



Chinese mall



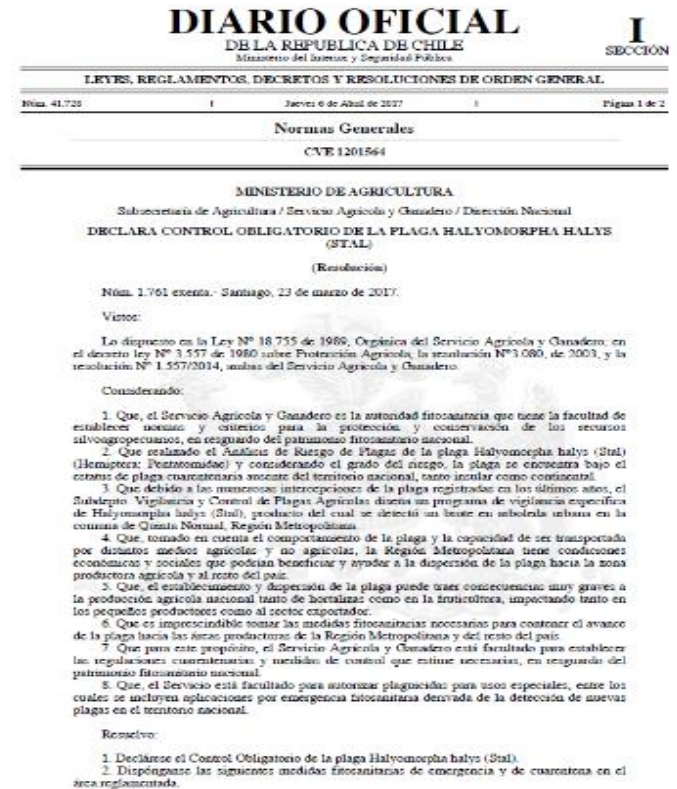
2016: The detection of several stages of *Halyomorpha halys* was confirmed

In December 2016, the **presence** (active population) of the pest was verified in urban trees (*Ailanthus altissima*, *Acer negundo*) of the Q. Normal Commune.



Actions

- In 2017, the official control of the pest is declared.
- The purchase of pheromone traps was managed.
- We contacted international experts and a super cooperative workgroup arrived from New Zealand in early spring 2017 with the first pheromone traps.



Traps Installation

- First Installation of traps



Actions

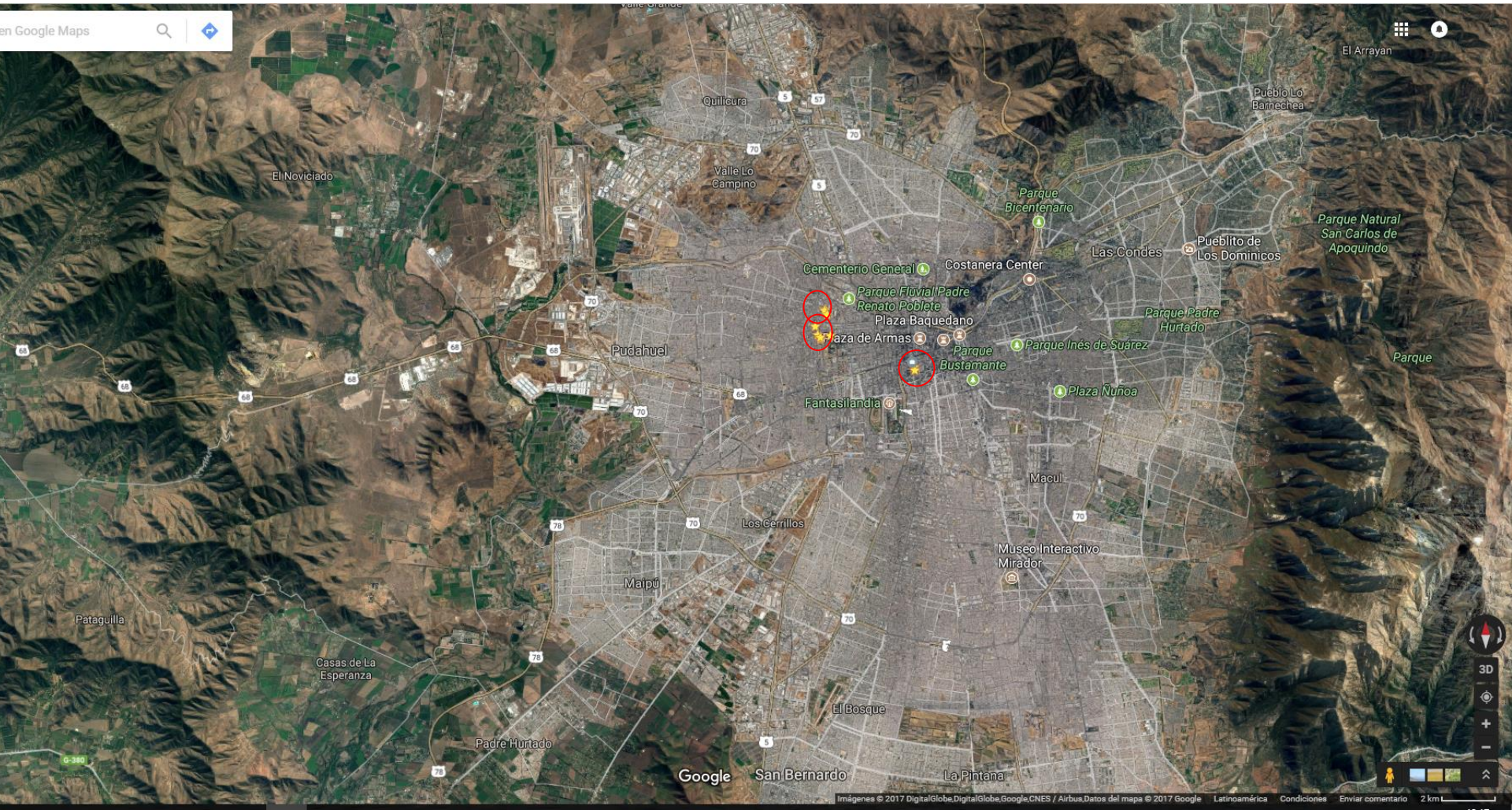
- A working radius of 500 M was established by installing 1 trap per block.
- A trap inspection methodology was developed.
- A trap net was established associated with risk areas



2016: Surveillance

Overview of the detections in Santiago and the nearest agricultural areas.

No traps were available at this time



2017: Traps Surveillance



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Halyomorpha halys

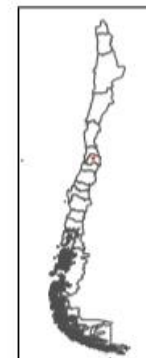
Distribución de Trampas -

Positivas 2017

Región Metropolitana

Leyenda

- Trampas Positivas
- Trampas



Información Cartográfica

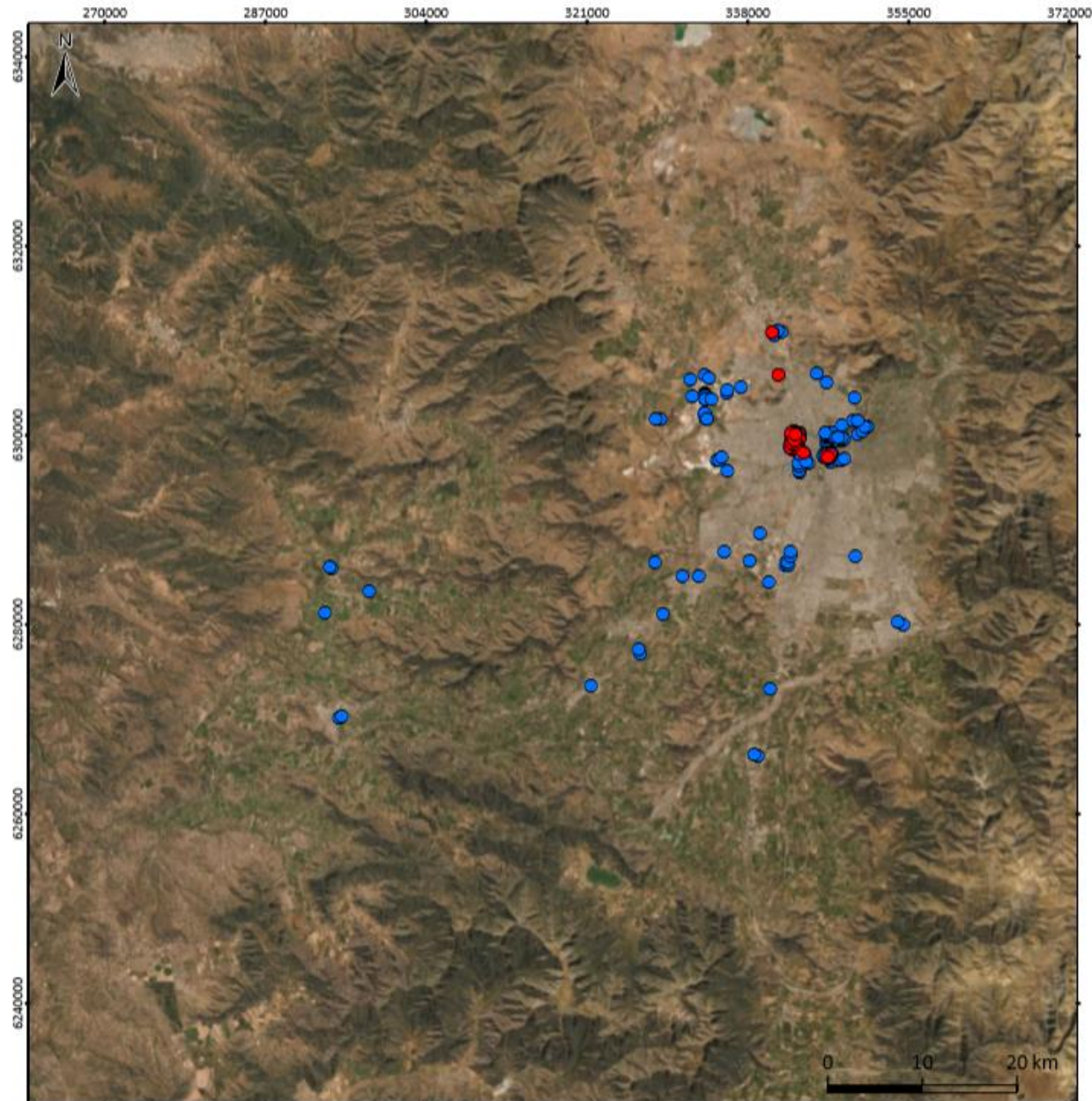
Datum WGS 84 - Zona 19 Sur

Escala: 330.000

Autor: Pablo Urbina (SIF/SAG)

Editor: Ilanía Astorga (CyVPA/SAG)

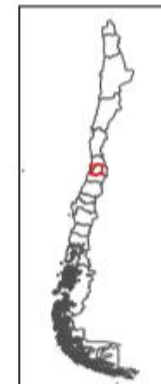
2018: Traps Surveillance



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Región Metropolitana

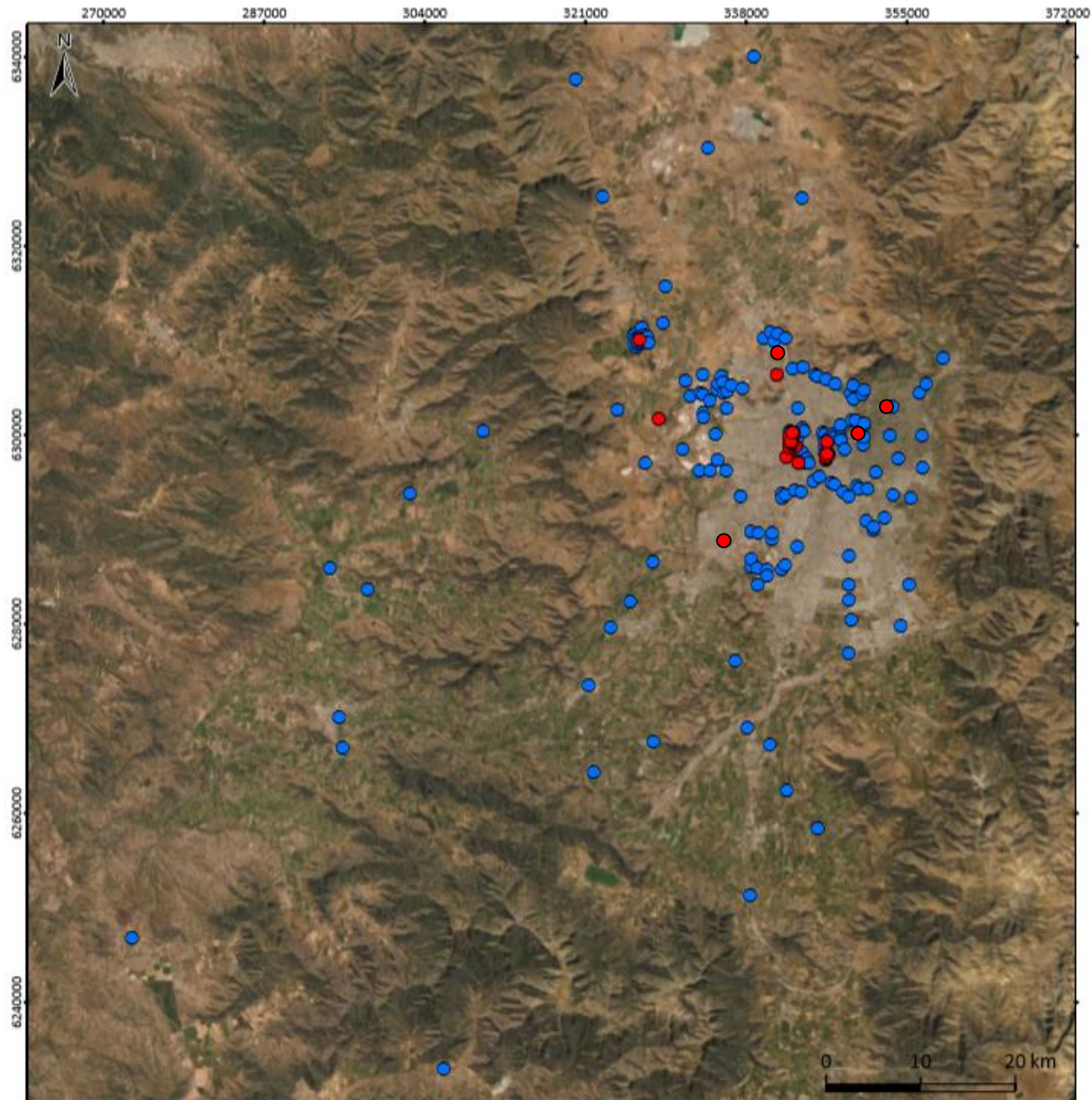
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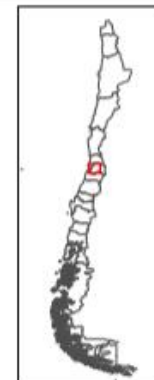
2019: Traps Surveillance



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Positivas 2019
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- Trampas



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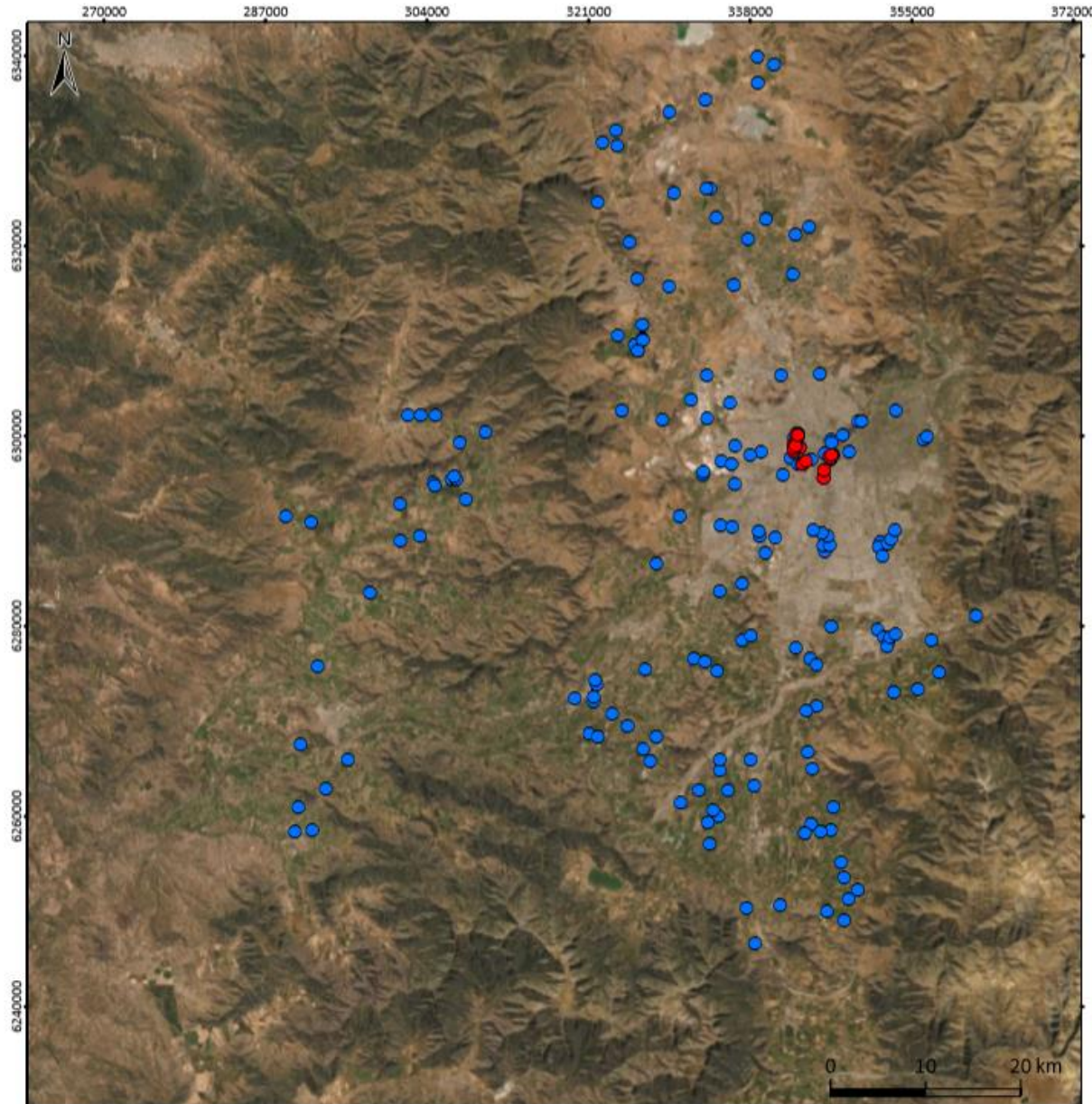
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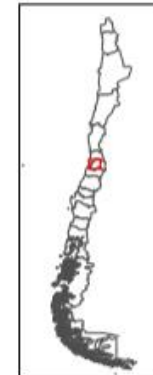
2020: Traps Surveillance



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Distribución de Trampas -
Positivas 2020
Región Metropolitana

Leyenda

- Trampas Positivas
- Trampas

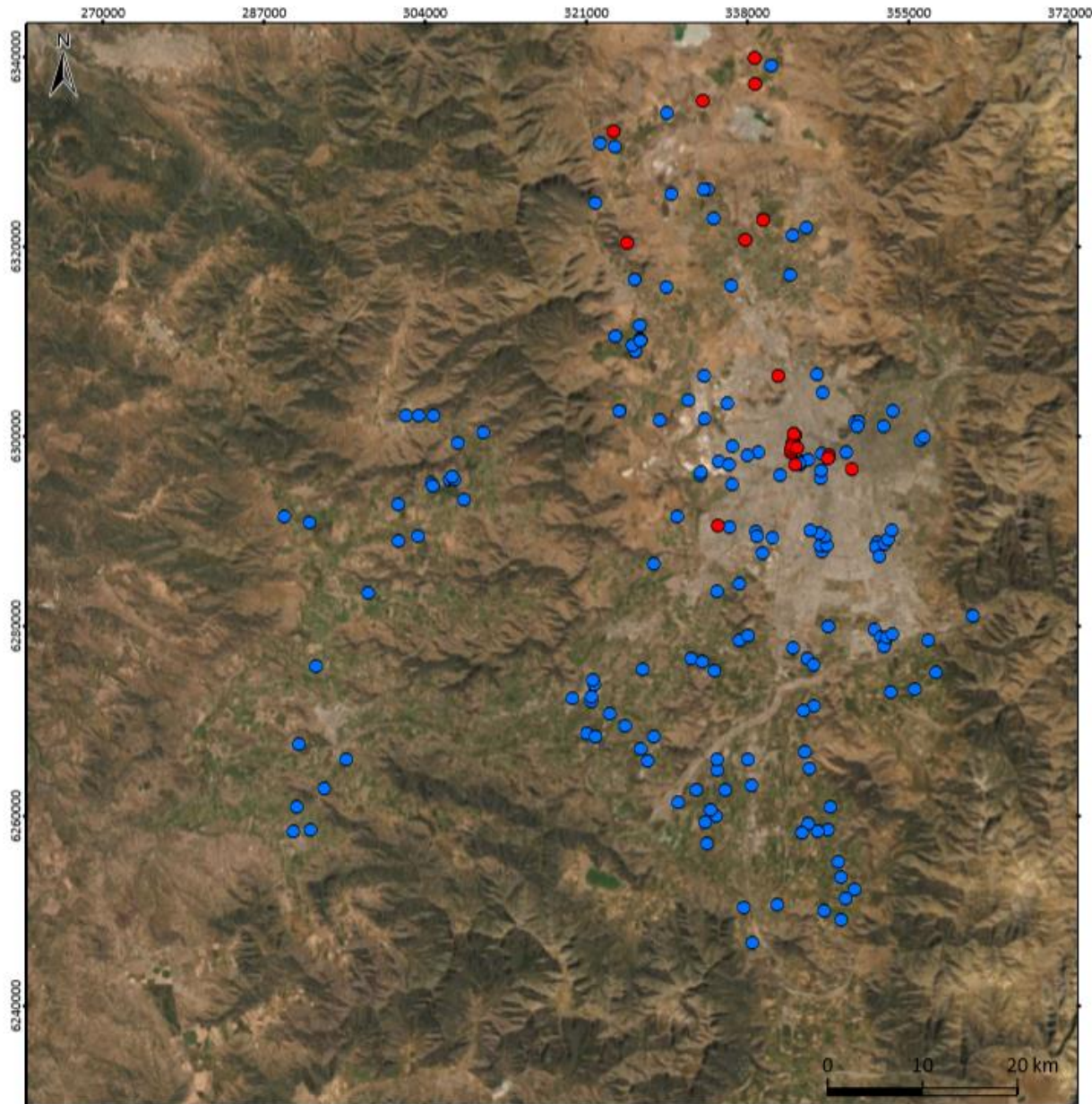


Información Cartográfica

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2021: Traps Surveillance



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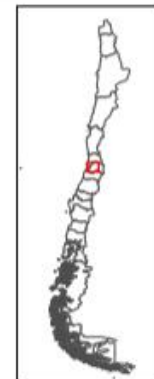
Halyomorpha halys

Distribución de Trampas -
Positivas 2021

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Leyenda

- Trampas Positivas
- Trampas



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Erradication?

Reasons why no attempt has been made to eradicate

- Due to the great dispersion in the city both in urban trees and plants inside private houses,
- the large size of the plants,
- the large number of BMSB hosts,
- the lack of adequate tools to carry out applications within the city,
- the toxicity of the products
- the lack of budget

make eradication actions impossible in Greater Santiago.

Petition process to release *Trissolcus*



There is an internal regulation, Resolution 2,229 / 2011, which establishes requirements for the admission of biological material in order to establish biological control programs.

The SAG, based on a Pest Risk Analysis, will evaluate the information presented, being able to:

- Authorize or reject the entry to the country of the requested agent or body.
- Request the study of specific complementary biological aspects,
- request an environmental impact assessment in those cases of polyphagous organisms

SERVICIO AGRICOLA Y GANADERO
DIRECCION NACIONAL

ESTABLECE NORMAS DE INGRESO
DE MATERIAL BIOLÓGICO Y DEROGA
RESOLUCIONES QUE INDICA

SANTIAGO, 24 DE SEPTIEMBRE DE 2001

HOY SE RESOLVIO LO QUE SIGUE:

Nº 2229 / ___ VISTO:

Lo dispuesto en el Decreto Ley no 3.557 de 1980, sobre Protección Agrícola, la Ley Nº 18.755 Orgánica del Servicio Agrícola y Ganadero, modificada por la Ley Nº 19.283, la Ley Nº 19.473 de 1996 sobre Ley de Caza, el Decreto Supremo Nº 5 de 1998 correspondiente al reglamento de la Ley de Caza, Resolución Nº 1.465 de 1981, la Resolución Nº 521 de 1992, la Resolución Nº 670 de 1999, todas del Servicio Agrícola y Ganadero, y el Código de Conducta para la importación y liberación de Agentes Exóticos de Control Biológico la Secretaría de la Convención Internacional de Protección Fitosanitaria

CONSIDERANDO:

- 1.- Que existen plagas cuyo ingreso al país puede provocar daños a la agricultura, silvicultura y/o flora nativa del país.
- 2.- Que existen algunos agentes exóticos de control biológico, polinizantes, organismos con propósitos de investigación o de ornamentación, cuyo uso puede ser beneficioso, mientras otros pueden producir impactos negativos en la sanidad vegetal, salud animal o en el medioambiente.
- 3.- Que los agentes exóticos de control biológico, polinizantes, organismos con propósitos de investigación o de ornamentación que ingresen al país, pueden estar parasitados o infectados por otras especies de organismos nocivos, los que pueden afectar el éxito de los programas en desarrollo o dañar los recursos vegetales y animales nativos del país.
- 4.- Que algunos substratos orgánicos o inorgánicos que se utilizan en el transporte de agentes exóticos de control biológico, polinizantes, organismos con propósitos de investigación o de ornamentación, pueden ser vías de diseminación de plagas cuarentenarias.
- 5.- Que se requiere actualizar las regulaciones cuarentenarias para el ingreso al país de agentes exóticos de control biológico, polinizantes, organismos con propósitos de investigación o de ornamentación.
- 6.- Que el Servicio Agrícola y Ganadero está facultado para establecer las regulaciones cuarentenarias que normen el ingreso al país de agentes exóticos de control biológico, polinizantes, organismos con propósitos de investigación o de ornamentación.



Plans for release if petition is approved



- Urban area, especially in Greater Santiago,
- The peri-urban area with established populations of the pest
- Rural areas that allow the subsistence of the parasitoid (wooded areas between agricultural orchards).



Halyomorpha halys

(Hemiptera: Pentatomidae)

2021



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