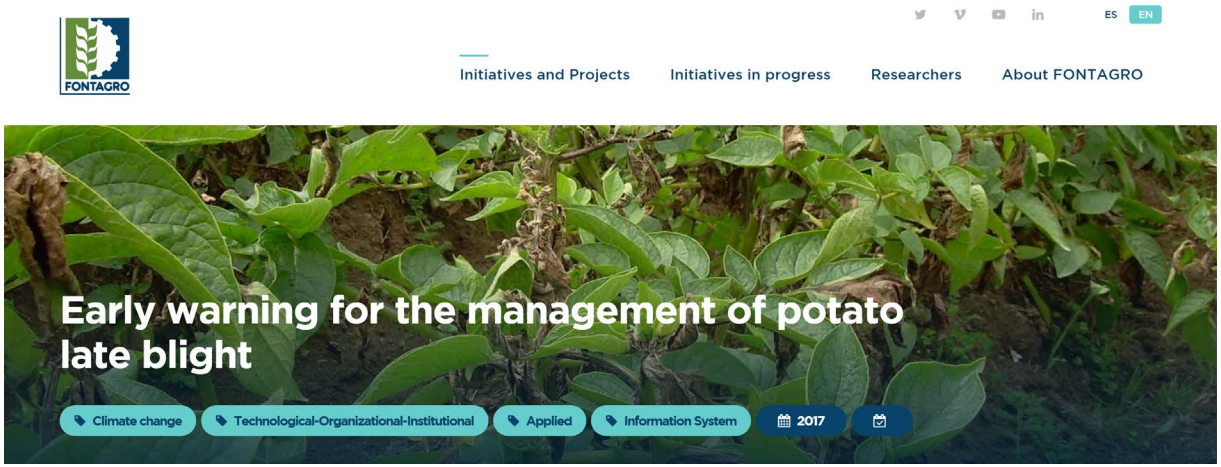
Tizon Latino

Latin American Network of cooperation for the study of Late blight of solanaceae

Florencia Lucca, I. Acuña, J. Andrade, W. Pérez, S. Restrepo, L. Barra

Main research lines



- Fontagro Project. Argentina, Chile, Ecuador, Panama
- International Potato Center (CIP): Peru, Ecuador
- Others countries involved: Colombia, Brazil, Uruguay, Costa Rica, Bolivia

VEINTE AÑOS | TWENTY YEARS FONTAGRO 1998•2018

INTA

Ministerio de Agricultura, Ganadería y Pesca
Presidencia de la Nación

Genotypic characterization

Argentine Consortium for Genomic Technology

Balcarce Agricultural Experimental Station and the Genomics Unit of the Institute of Biotechnology

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INTA

Ministerio de Agricultura, Ganadería y Pesca
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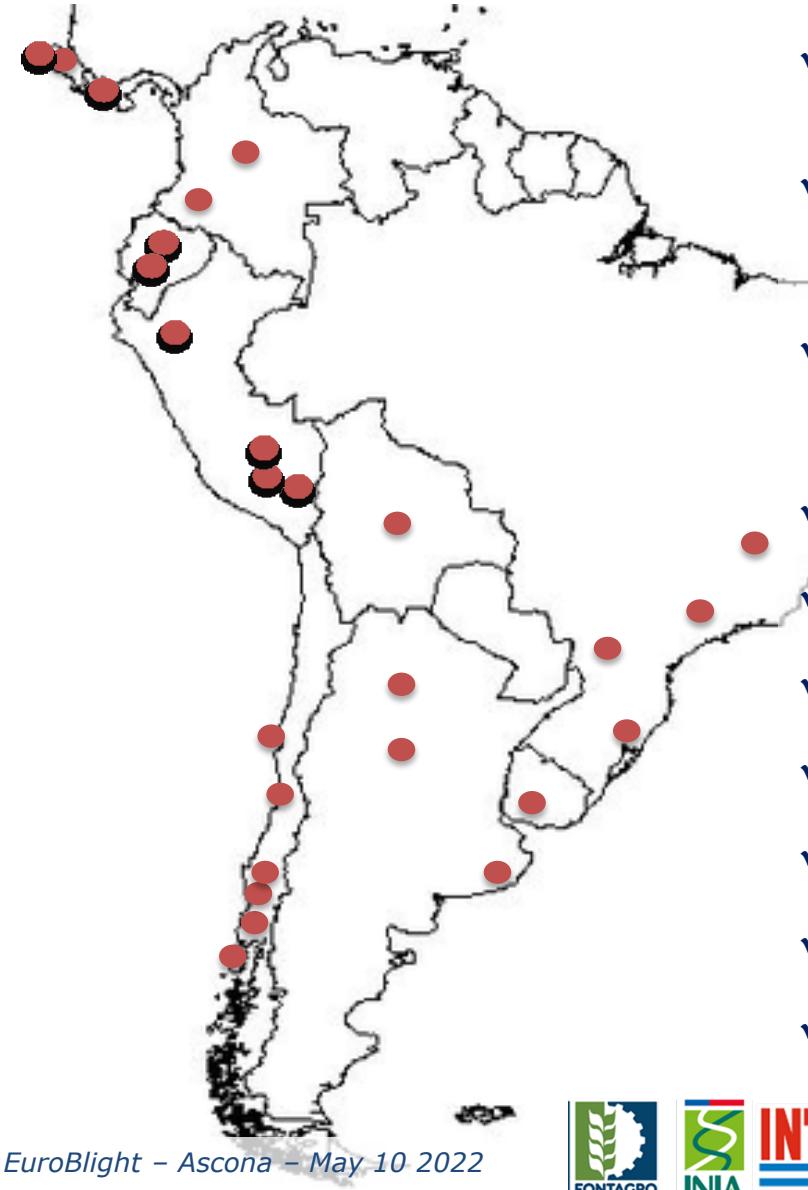
Isolates genotyped at INTA

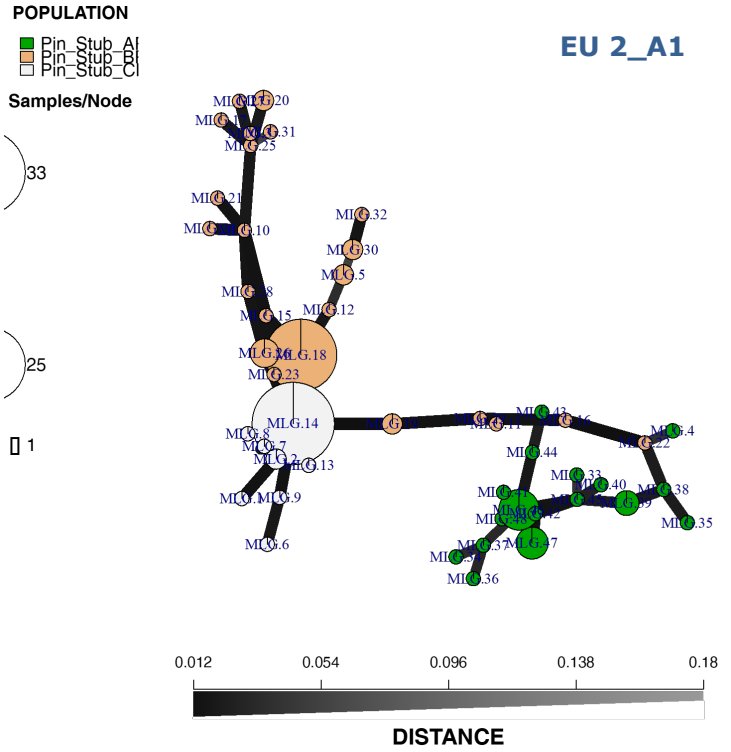


- ✓ **Argentina:** Tucuman, Cordoba, Southeast of Buenos Aires Province
- ✓ **Brazil:** Parana, Rio Grande do Sul, São Paulo, Minas Gerais
- ✓ **Chile:** Coquimbo, Los Rios, La Araucania, Los Lagos, Valparaíso
- ✓ **Uruguay:** San Jose
- ✓ **Costa Rica:** San Jose, Cartago
- ✓ **Panama:** Cerro Punta
- ✓ **Ecuador:** Chimborazo, Carchi
- ✓ **Peru:** Apurimac, Cajamarca, Cuzco, Puno
- ✓ **Colombia:** Central & Southern region
- ✓ **Bolivia**

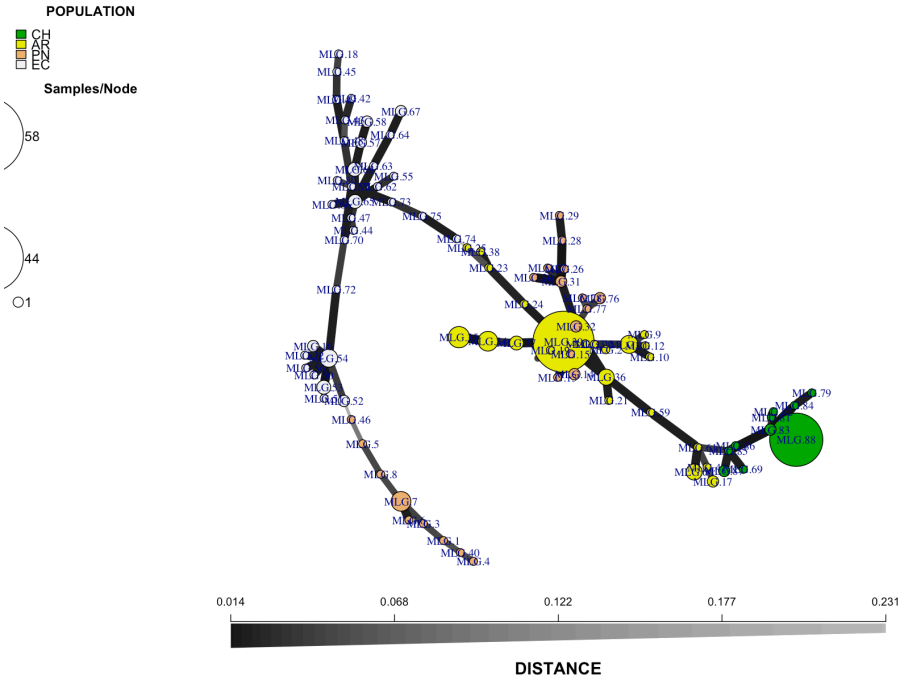
Isolates genotyped at INTA

- ✓ **Argentina:** Tucuman, Cordoba, Southeast of Buenos Aires Province **2_A1**
- ✓ **Brazil:** Parana, Rio Grande do Sul, São Paulo, Minas Gerais **2_A1**
- ✓ **Chile:** Coquimbo, Los Rios, La Araucania, Los Lagos, Valparaíso **2_A1**
- ✓ **Uruguay:** San Jose **2_A1**
- ✓ **Costa Rica:** San Jose, Cartago (?)
- ✓ **Panama:** Cerro Punta two patterns (?)
- ✓ **Ecuador:** Chimborazo, Carchi **EC_1**
- ✓ **Peru:** Apurimac, Cajamarca, Cuzco, Puno(?)
- ✓ **Colombia:** Central & Southern region **EC_1**
- ✓ **Bolivia** **Bol-1**

Results



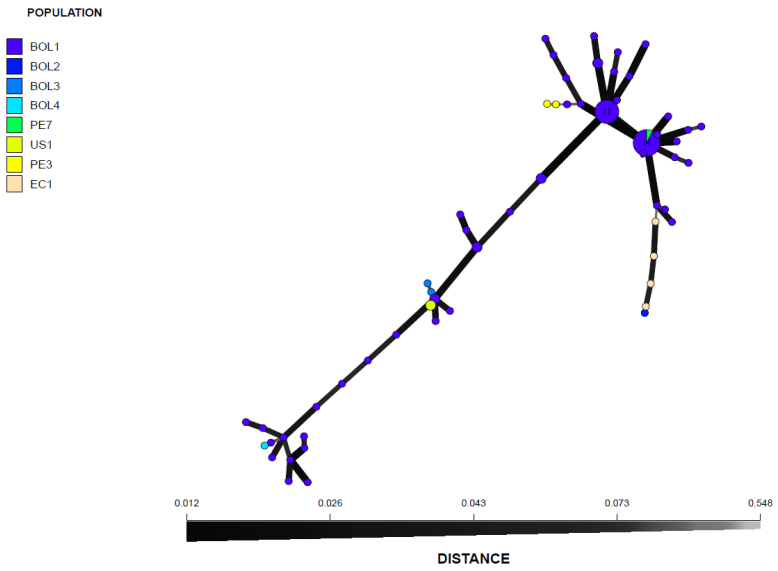
Argentina, Brazil, Chile (2017-18)



Argentina, Chile, Ecuador, Panama (2018-19)

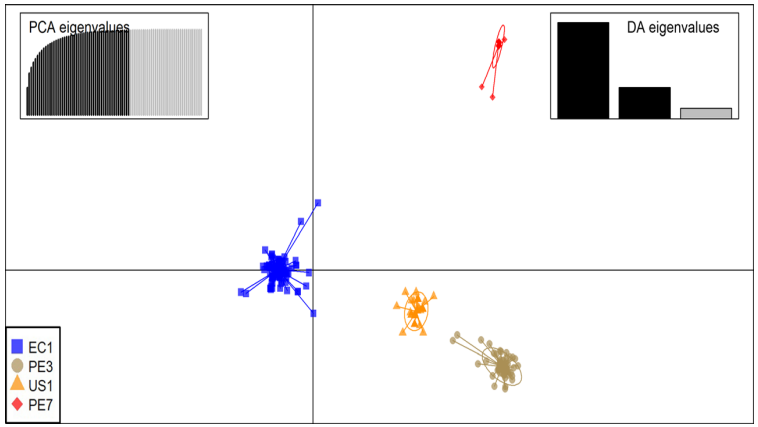
F Lucca, I Acuña, C Tello, R Morales, S Zanotta

Results



MSN of multilocus genotypes of *Phytophthora infestans* isolates from Bolivia and Peru.

- 76 samples from different localities of Bolivia
- 72 were grouped in one Genotype: Bol1
- The PE-7 variant from Puno (border Peru-Bolivia) grouped with Bol1
- One isolate from Bolivia grouped with EC-1 clonal lineage



Discriminant analysis of principal components (DAPC) plot based on the microsatellite marker analysis separating the *Phytophthora infestans* isolates into four clonal lineages EC-1, PE-3, US-1 and PE-3. 2015-17

https://doi.org/10.1111/ppa.13125

J Andrade, W Perez, S Gamboa

Publications

Persoonia 41, 2018: 39–55
www.ingentaconnect.com/content/nhn/pimj
RESEARCH ARTICLE
ISSN (Online) 1878-9080
https://doi.org/10.3767/persoonia.2018.41.03

***Phytophthora betacei*, a new species within *Phytophthora* clade 1c causing late blight on *Solanum betaceum* i**

M.F. Mideros[1], D.A. Turissini[2], N. Guayazán[1], H. Ibarra-Avila[3], G. Da
M. Cárdenas[1], K. Myers[7], J. Tabima[4], E.M. Goss[5], A. Bernal[1], L.E. L
A. Grajales[1], L.N. Gonzalez[1], D.E.L. Cooke[8], W.E. Fry[7], N. Grünwal
D.R. Matute[2], S. Restrepo[1]

Phytopathology • 2019 • 109:145-154 • https://doi.org/10.1094/PHYTO-05-18-0157-R

Population Biology

e-Xtra*

Determining Whether Geographic Origin and Potato Genotypes Shape the Population Structure of *Phytophthora infestans* al Region of Colombia

ı Camila Rodríguez, María Fernanda Mideros,
rlos E. Ñústez, and Silvia Restrepo†

ıcias Biológicas, Universidad de los Andes, Bogotá, Colombia; fourth author:
Experimental Agropecuaria Balcarce, República Argentina; and fifth author:
, Universidad Nacional de Colombia, Bogotá, Colombia.

Phytopathology • XXXX • XXX:X-X • https://doi.org/10.1094/PHYTO-05-19-0175-R

Population Biology

e-Xtra*

Plant Pathology (2020) **69**, 334–346

Doi: 10.1111/ppa.13125

Population structure and host range of the potato late blight pathogen *Phytophthora infestans* in Peru spanning two decades

H. Lindqvist-Kreuze[a]*, S. Gamboa[a], M. Izarra[a], W. Pérez[a]
T. Särkinen[b], M. Cueva[c] and P. Gonzáles[c]

[a]*International Potato Center (CIP), Avenida La Molina 1558, Lima 12, Peru;* [b]*Royal Botanic Gard*
5LR Edinburgh, UK; and [c]*Laboratorio de Florística, Departamento de Dicotiledóneas, Museo de*
Mayor de San Marcos, Lima 14, Peru

Two Clonal Species of *Phytophthora* Associated to Solanaceous Crops Coexist in Central and Southern Colombia

Sandra Catalina Chaves,[1] Natalia Guayazán,[1] Maria Fernanda Mideros,[1] Mayra Parra,[1]
Florencia Lucca,[2] and Silvia Restrepo[1,†]

ı Química, Universidad de los Andes, Bogotá, Colombia
ıología Agropecuaria, Estación Experimental Agropecuaria Balcarce, República, Argentina
5 March 2020.

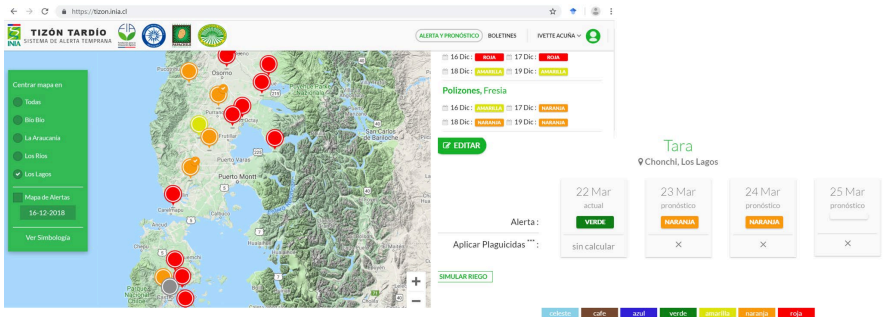
Phenotypic and genotypic characterization of Phytophthora infestans isolates associated to tomato and potato crops in Colombia

Andrea Olave, Dixon Cardenas, Silvia Restrepo, Florencia Lucca, William Fry, Kevin L. Myers,
Giovanna Danies, and Mauricio Soto-Suarez

Published Online: 5 Feb 2022 | https://doi.org/10.1094/PHYTO-04-21-0158-R

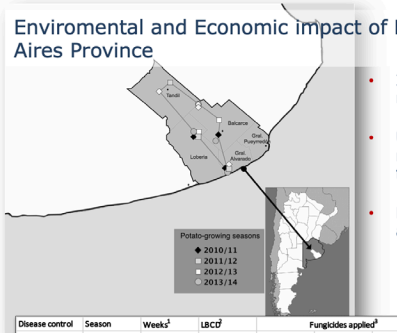
DSS evaluation and implementation

Chile DSS (http://tizon.inia.cl)



- **Weather network data: 54 stations**
  - 3 days forecast
  - 5000 farmers registered
- **80% of the potato area in Chile**
  - Information delivery: SMS, webpage, e-mail

PhytoAlert DSS, Argentina



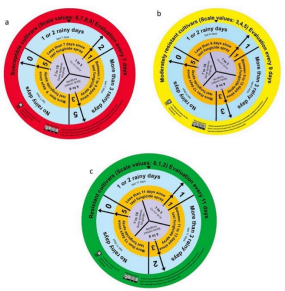
- Integrates weather-driven biology of the pathogen, host resistance and degradation of previously applied fungicides.
- Uses hourly weather data (relative humidity, temperature, rain/irrigation) from World Weather databases (recorded and forecasted weather data).
- Determines ideally and preferably fungicide preventive application just before predicted infection events.

Disease control	Season	Weeks[1]	LBCD[2]	Fungicides applied[3]	Sprays[4]	Yield (t ha^{-1})	EIQ-FUR[5]	Seasonal cumulative EIPs A.	Soil	Gr	Cost[6] (US$ ha^{-1})
					11	56.1	374.0	516	462	39	440.7
					7	55.0	192.4	263	315	11	293.4
					13	58.0	451.0	683	1187	43	434.5
					9	48.0	316.5	437	503	15	309.4
					10	***54.2***	***333.5***	***474***	***617***	***27***	***369.5***
					15	55.2	447.2	546	742	575	498.3
					14	53.0	422.9	622	1056	39	446.5
					12	59.0	423.5	641	1106	40	419.5
					13	47.7	419.9	1017	824	84	583.8
					13.5	***54.2***	***435.9***	***706***	***932***	***184***	***487.0***

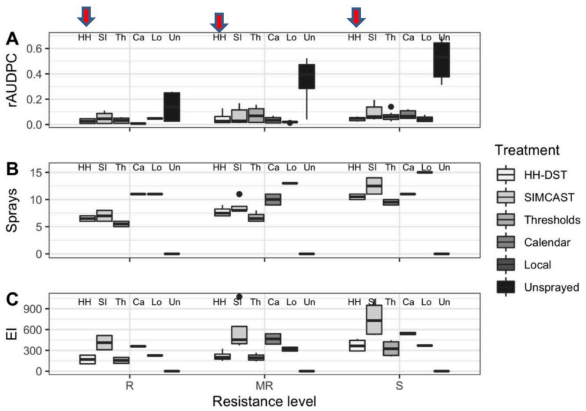
[1]le applications as protectant, curative or eradicant; [4]Number of sprays per season; [5]EIQ-FUR for

Agricultura,
Pesca
cia de la Nación

A simple, hand-held decision support designed tool to help resource-poor farmers improve potato late blight management (Peru and Ecuador)

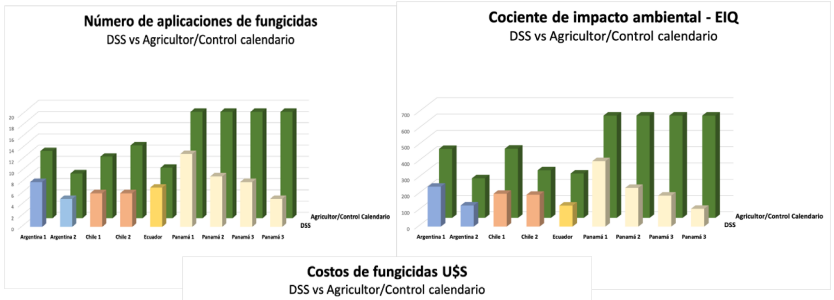


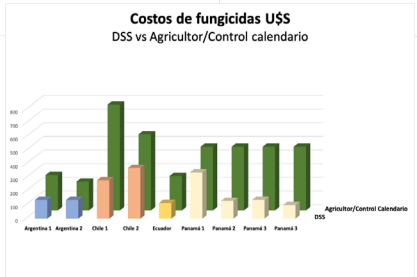
Hand-held decision support tool disks used for a) susceptible, b) moderately resistant and, c) resistant potato varieties.

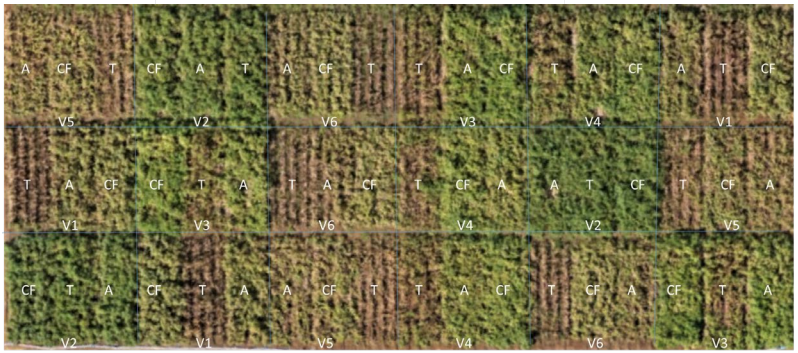


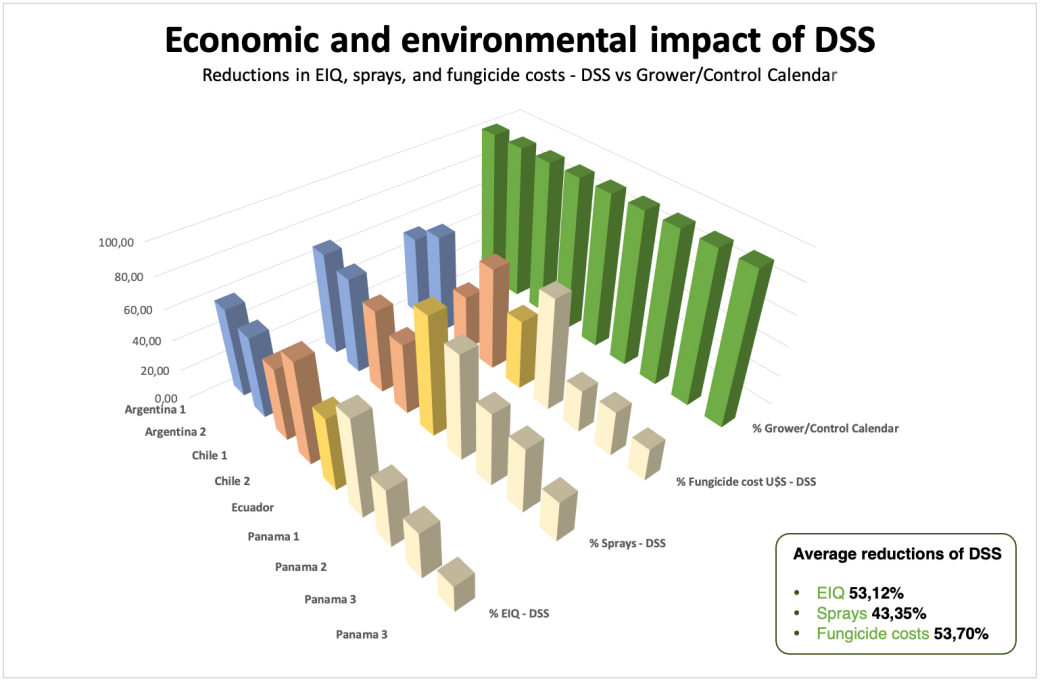
https://doi.org/10.1016/j.cropro.2020.105186

DSS evaluation and implementation - LAC

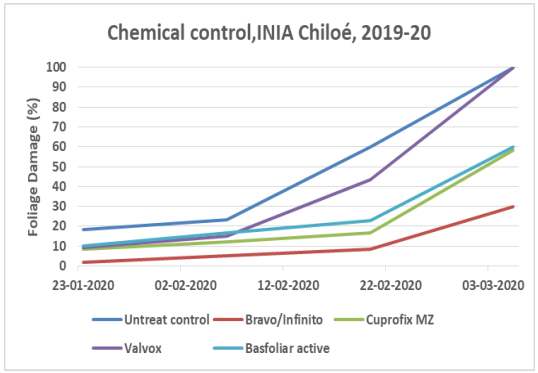


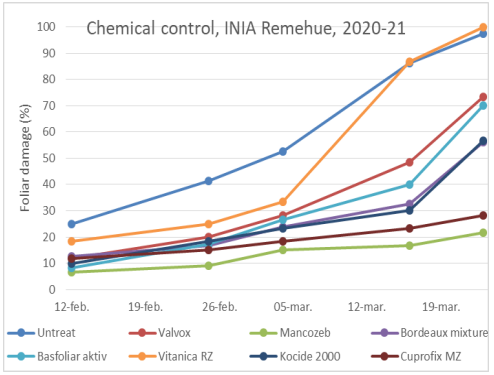


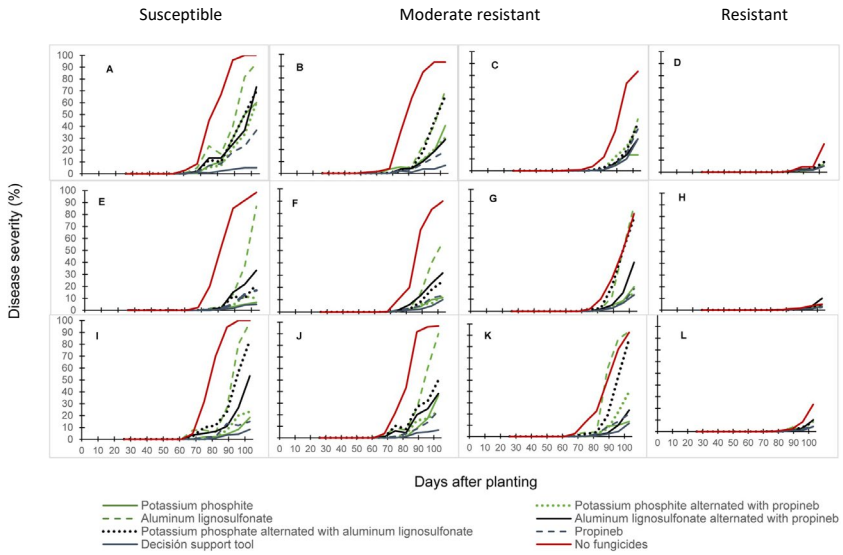




Evaluation of cooper and resistance inductor products (Peru, Chile)



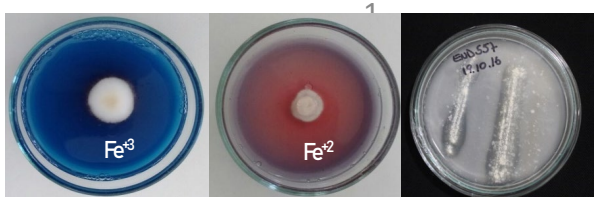




https://doi.org/10.1016/j.cropro.2020.105241

Biocontrol: Endophitic colonization

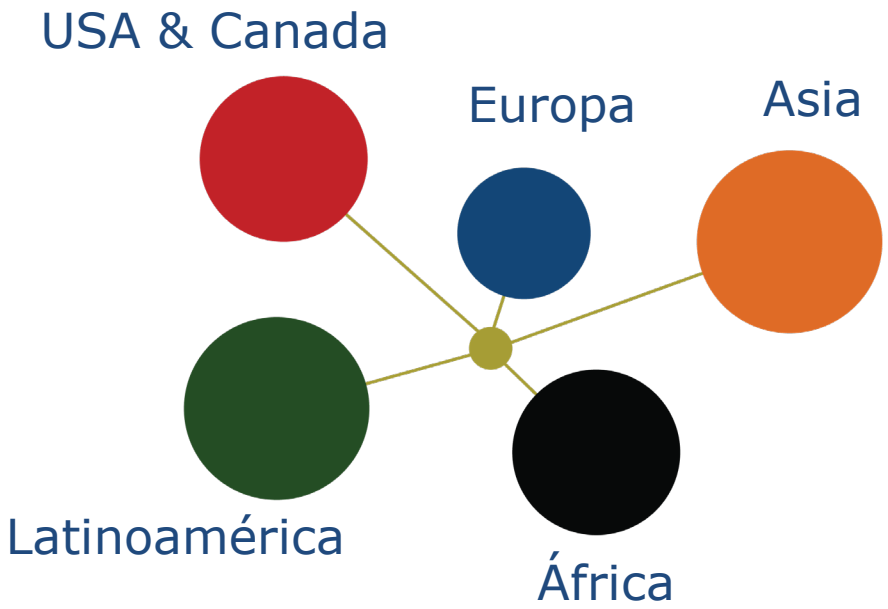
- 150 isolates evaluated from genera: *Beauveria, Metarhizium, Trichoderma, Clonostachys, Paecilomyces*.
- 103 isolates are endophitic on tomato: 21 isolates show systemic action .
- 8 isolates are generalistic: colonized tomato, hot pepper, pepper, cucumber, soy bean, clover, blueberry.
- 5 isolates are endophytic on potato: 2 sistemics and 3 localized on roots: Beauveria y Trichoderma.
- Reseach on multiple actions of endophytic fungi



Dr. L. Barra

Future actions in Tizón Latino Network

- Monitoring and characterization *P. infestans* in Latin America - Manuscript
- Training and outreaching activities (genotyping/phenotyping)
- Genotype map of *P. infestans* populations
- Global and local scenario studies on *P. infestans* populations migrations (Colombia).
- Global Blight Network database to analyze the dynamics of *P. infestans* populations
- Characterization of Alternaria population associated with potatoes in Latin America
- Improved DSS systems: Variety, products, farmers.
- Alternative products, biocontrol and host resistance for control strategies on late blight and early blight.
- Characterization of native *Solanum* for Late blight resistance focus in breeding programs.
- Endophytic induce resistance in plants for Late blight


USA & Canada
Europa
Asia
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África