

IL PROGETTO PROSPECT

NUOVE TECNICHE DI MIGLIORAMENTO GENETICO PER LA
PRODUZIONE DI GENOTIPI RESISTENTI A PATOGENI IN SPECIE DI
INTERESSE COMMERCIALE PER IL SETTORE ORTICOLO PIEMONTESE

Alberto Acquadro
DISAFA



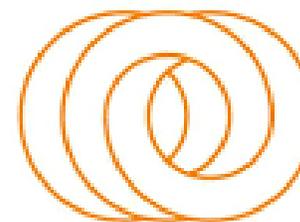
**UNIVERSITÀ
DI TORINO**



IL PROGETTO PROSPECT



AGROALIMENTARE 4.0



FONDAZIONE CRC

IL PROGETTO PROSPECT

INIZIO

2019

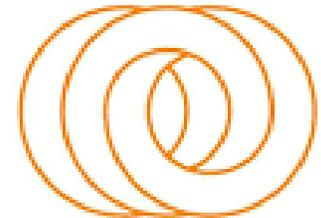


FINE

2022



AGROALIMENTARE 4.0



FONDAZIONE CRC

IL PROGETTO PROSPECT

INIZIO

2019



FINE

2022

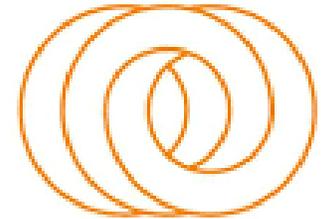


FINE

2023



AGROALIMENTARE 4.0

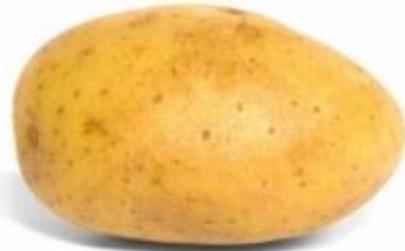


FONDAZIONE CRC



PROSPECT

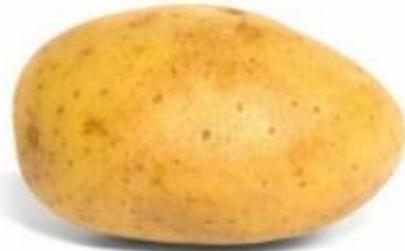




PROSPECT

Gli obiettivi

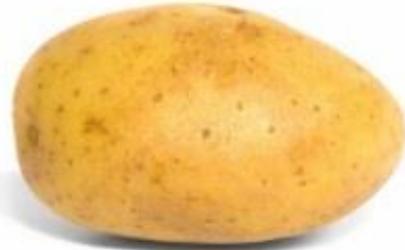
1. **OTTIMIZZARE** la tecnica **CRISPR/Cas9** in patata, pomodoro e peperone



PROSPECT

Gli obiettivi

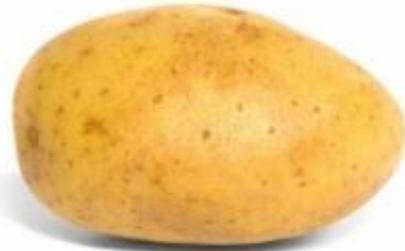
1. OTTIMIZZARE la tecnica CRISPR/Cas9 in patata, pomodoro e peperone
2. SVILUPPARE GENOTIPI RESISTENTI/TOLLERANTI a PERONOSPORA e OIDIO



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1. OTTIMIZZARE la tecnica CRISPR/Cas9 in patata, pomodoro e peperone
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3. **RIDURRE l'uso di sostanze chimiche in agricoltura**



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Gli obiettivi

1. OTTIMIZZARE la tecnica CRISPR/Cas9 in patata, pomodoro e peperone
2. SVILUPPARE GENOTIPI RESISTENTI/TOLLERANTI a PERONOSPORA e OIDIO
3. RIDURRE l'uso di sostanze chimiche in agricoltura
4. **AUMENTARE la CONOSCENZA sui GENI di SUSCETTIBILITÀ (S)**

PROSPECT

Pathogen Resistance introduction in commercially important horticultural Species in Piedmont

I PATOGENI

PROSPECT

Pathogen Resistance introduction in commercially important horticultural Species in Piedmont



Phytophthora infestans

I PATOGENI

PROSPECT

Pathogen Resistance introduction in commercially important horticultural Species in Piedmont



Phytophthora infestans

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Leveillula taurica

I PATOGENI

PROSPECT

Pathogen Resistance introduction in commercially important horticultural Species in PiEdmonT



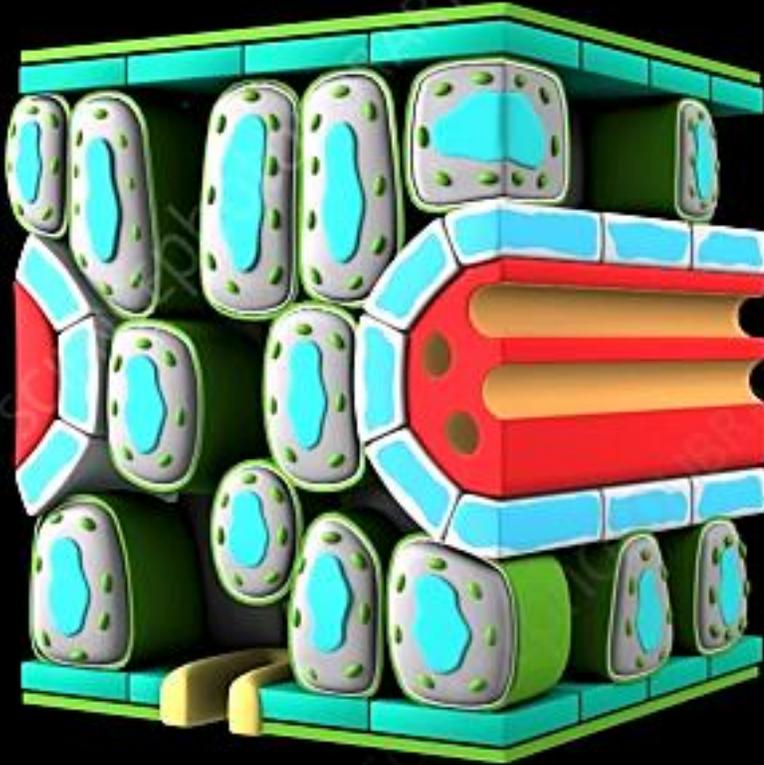
Leveillula taurica

PROSPECT

Pathogen **R**esistance introduction in commercially important h**O**rticultural **S**pecies in **Pi**Edmon**T**

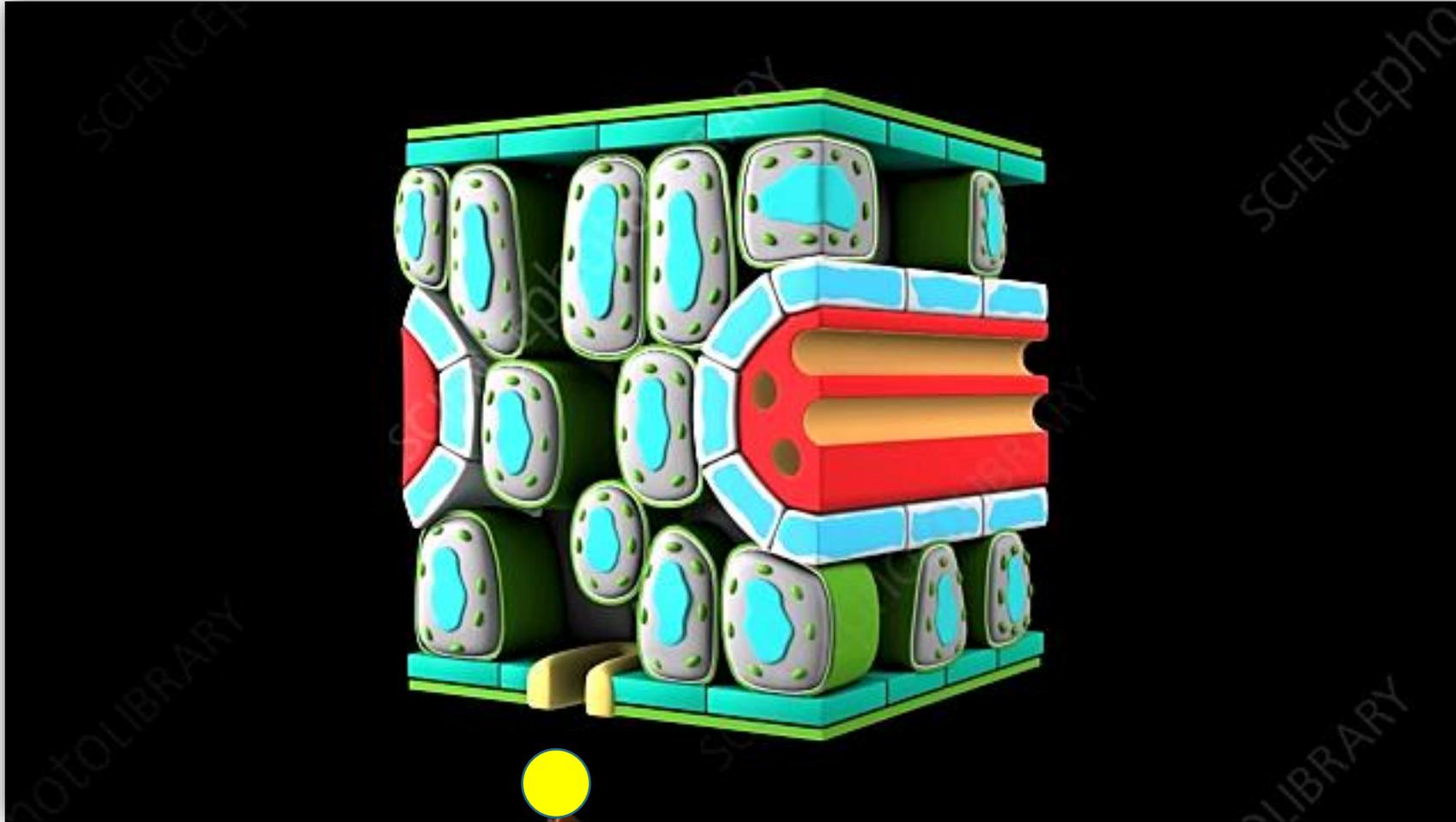


INFEZIONE di un patogeno (fungino)



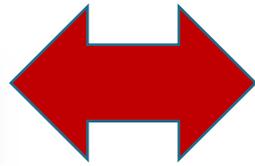
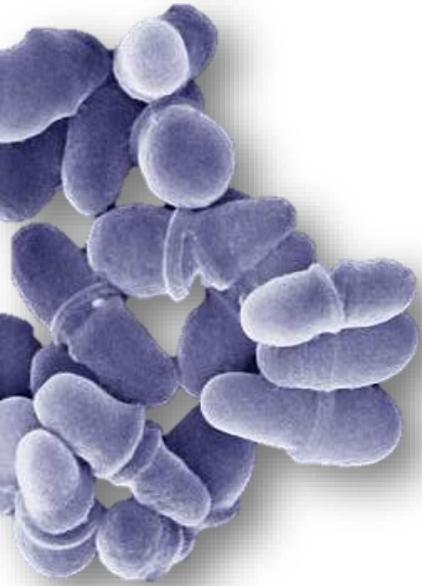
- Fase di penetrazione
- Fase colonizzazione
- Fase di uscita

INFEZIONE di un patogeno (fungino)



- Fase di penetrazione
- Fase colonizzazione
- Fase di uscita

RESISTENZA della PIANTA ad un patogeno



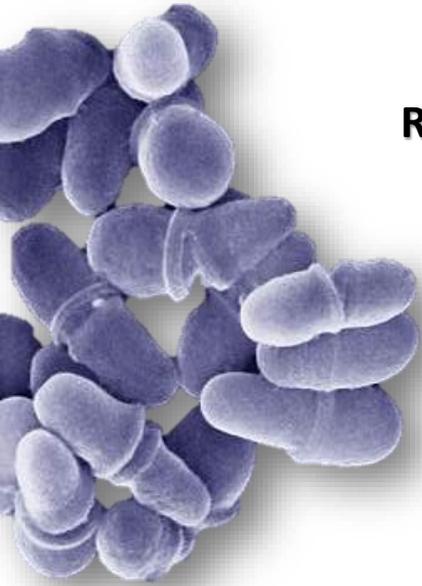
**RICONOSCIMENTO
del patogeno**



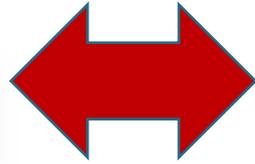
RESISTENZA della PIANTA ad un patogeno



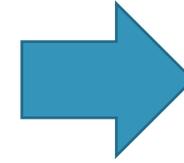
RESISTENZA della PIANTA ad un patogeno



**GENI di
RESISTENZA (R)**



**RICONOSCIMENTO
del patogeno**



**Attacco ed
Eliminazione del
patogeno**

PROSPECT

Geni suscettibilità

Sono geni utilizzati dal patogeno durante la colonizzazione e l'infezione.

PROSPECT

Geni suscettibilità

Sono geni utilizzati dal patogeno durante la colonizzazione e l'infezione.



Sono geni della pianta che facilitano l'infezione

Metafora del ladro (*patogeno*)



Geni suscettibilità

Geni della pianta che
facilitano l'infezione

Metafora del ladro (*patogeno*)



Geni suscettibilità

Geni della pianta che
facilitano l'infezione

Metafora del ladro (patogeno)



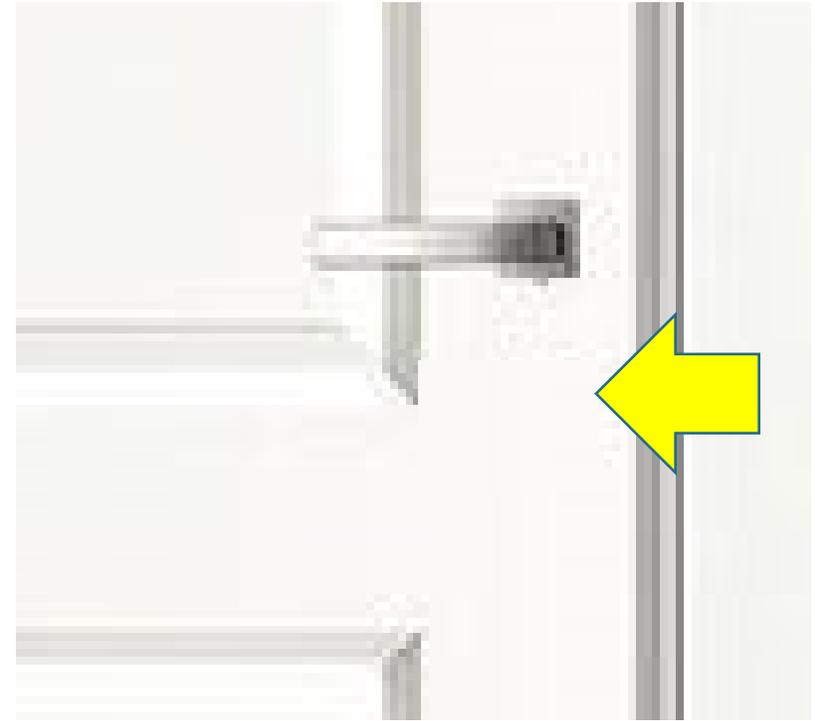
Geni suscettibilità
**Geni della pianta che
facilitano l'infezione**





Geni suscettibilità

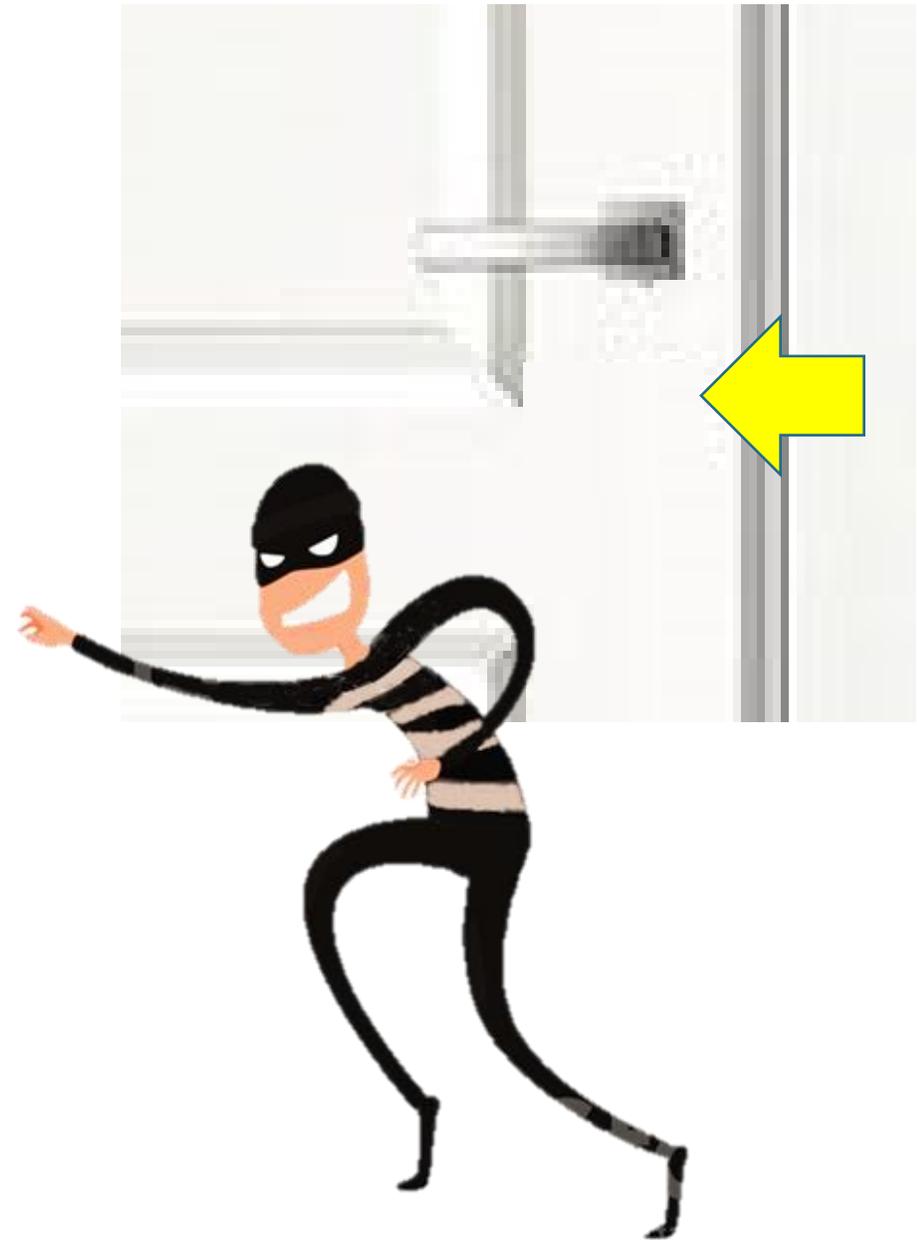
Geni della pianta che facilitano l'infezione



**Eliminiamo serratura
(chiave elettronica)**

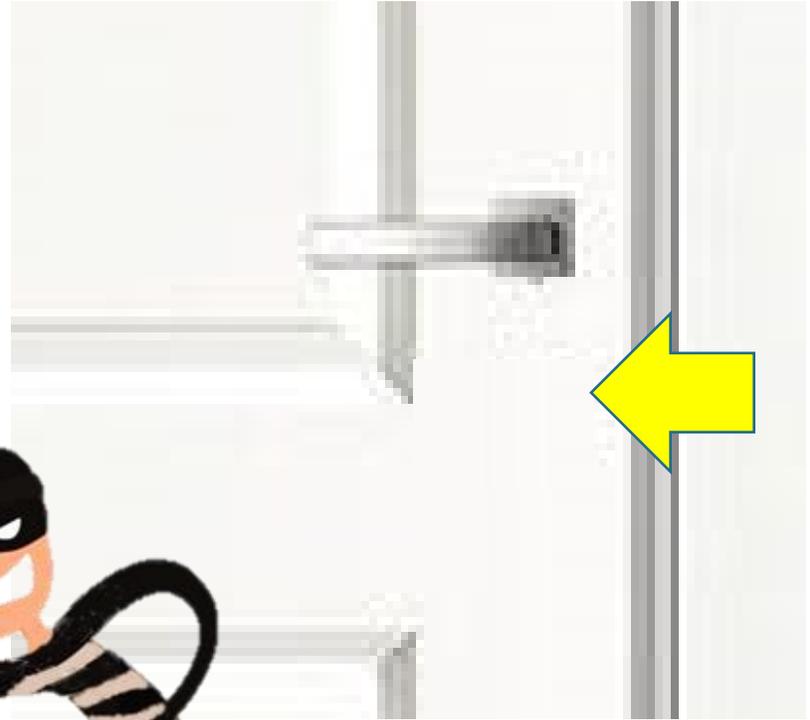


Eliminiamo serratura: chiave elettronica





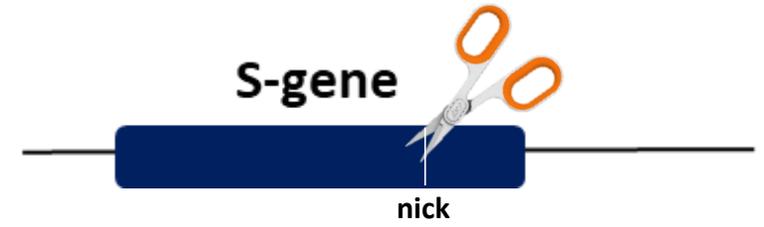
Eliminiamo serratura: chiave elettronica



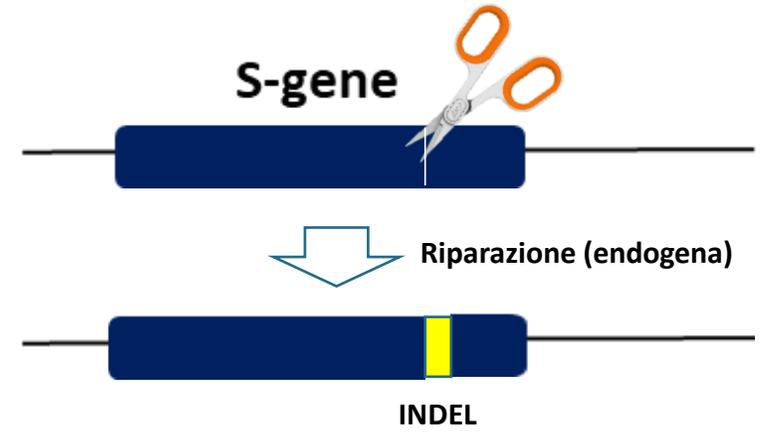


ALTERARE un GENE-S

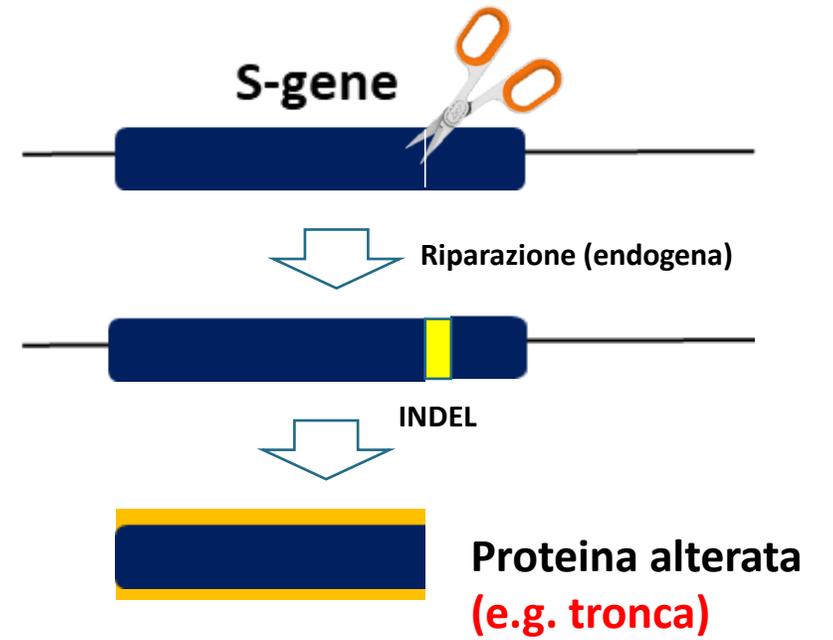
CRISPR/Cas9



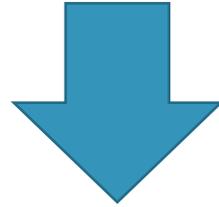
ALTERARE un GENE-S



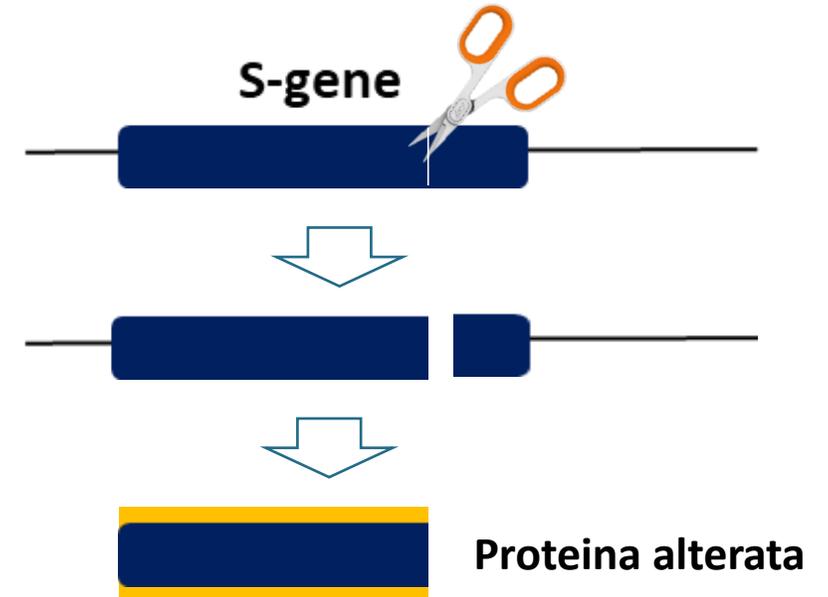
ALTERARE un GENE-S



ALTERARE un GENE-S



può indurre TOLLERANZA
ad un patogeno



IL PROGETTO

PROSPECT

Pathogen Resistance introduction in commercially important horticultural species in Piedmont

IL PROGETTO

PROSPECT

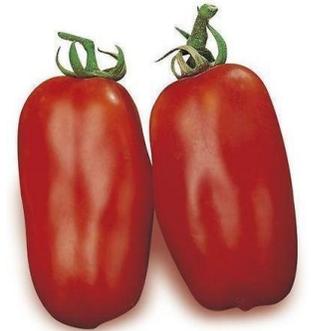
Pathogen Resistance introduction in commercially important horticultural Species in **PiEdmonT**

IL PROGETTO

PROSPECT



Cuore di Bue



San Marzano

Pathogen Resistance introduction in commercially important horticultural Species in **PiEdmonT**

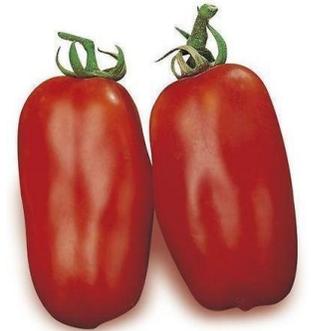
IL PROGETTO

PROSPECT

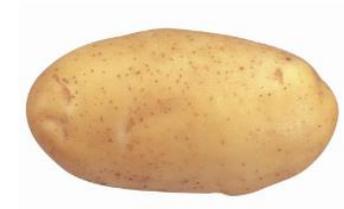
Pathogen Resistance introduction in commercially important horticultural Species in **PiEdmonT**



Cuore di Bue



San Marzano



Penelope



Desiree

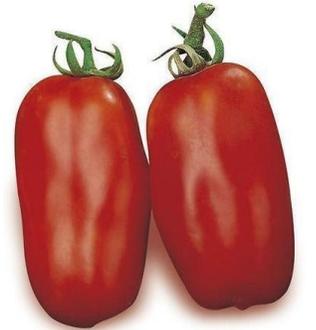
IL PROGETTO

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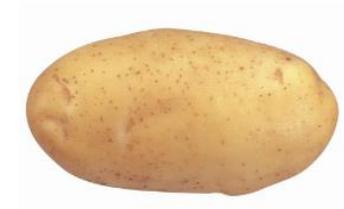
Pathogen Resistance introduction in commercially important horticultural Species in **PiEdmonT**



Cuore di Bue



San Marzano



Penelope

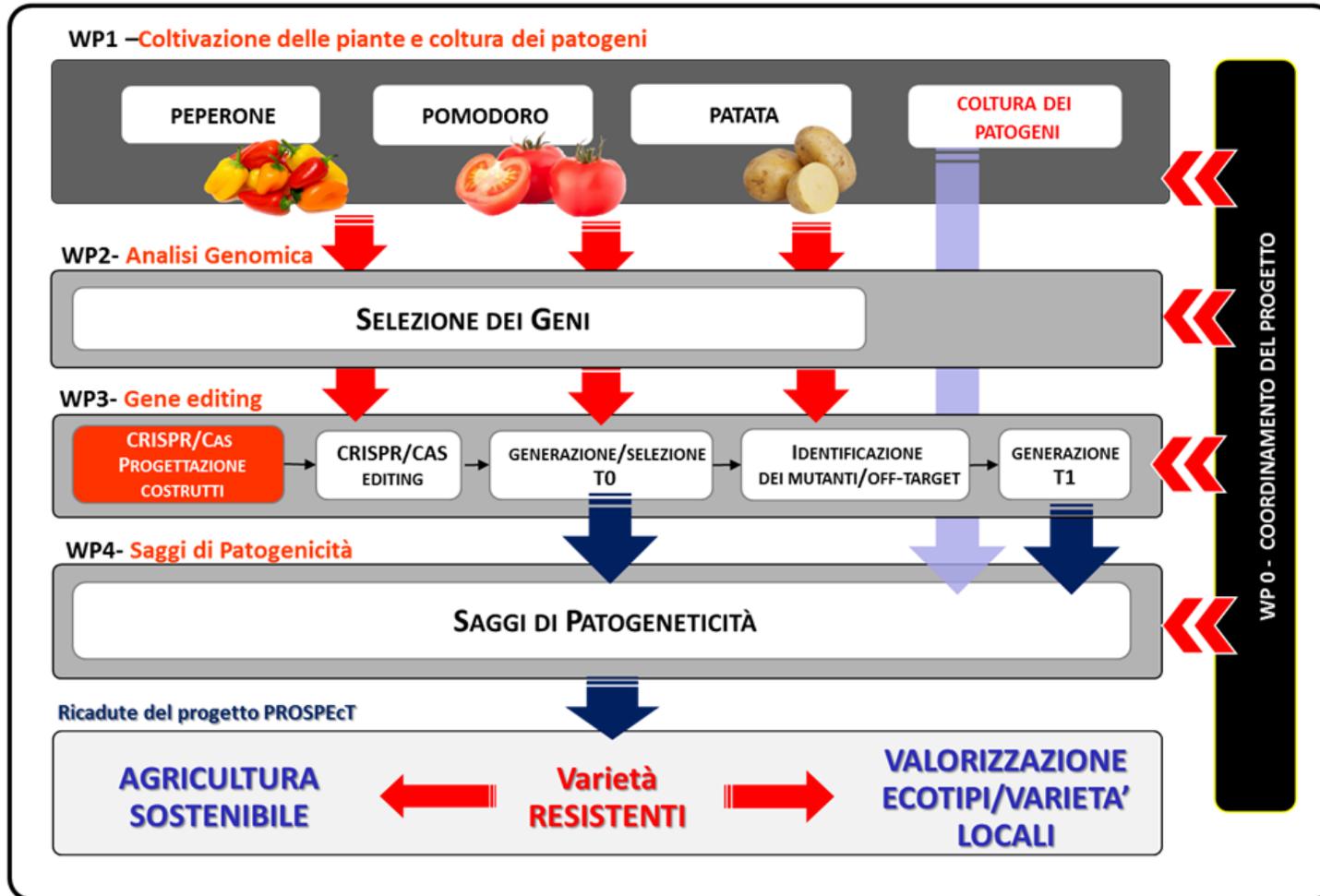


Desiree



Cuneo

PROSPECT



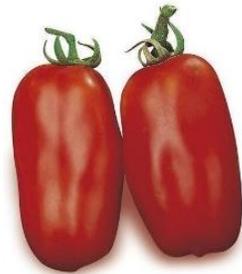
5 Working package

1. MATERIALI e COLTIVAZIONE
2. SELEZIONE dei GENI (S)
3. GENE EDITING
4. ANALISI di PATOGENICITA
5. DISSEMINAZIONE RISULTATI

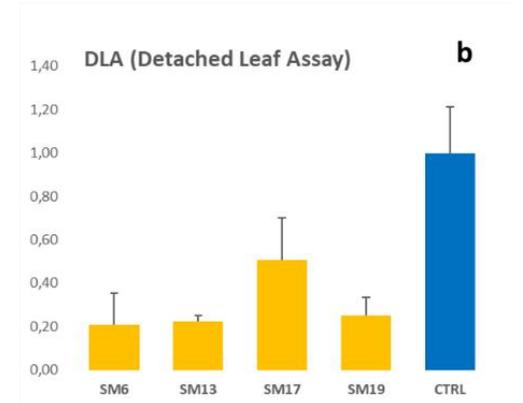
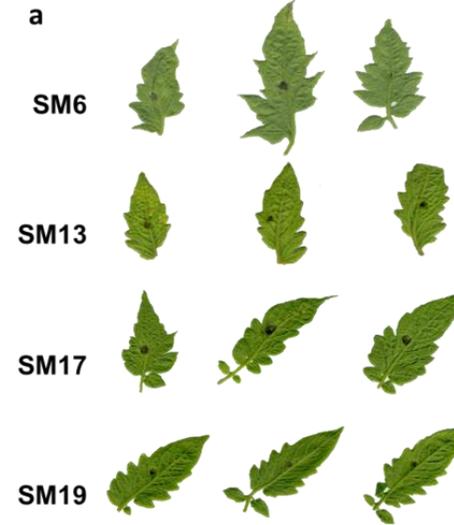
POMODORO



Cuore di Bue
San Marzano



EDITING



GENI-S

PMR4

Powdery Mildew Resistance 4

DMR6

Downy Mildew Resistance 6

Ruiling LI



Alex Maioli



Federica De Marchi



PATATA

Desiree
Penelope



50 Mutanti



EDITING

IMAGE J &
Analisi Statistica

Sequenziamento
Locus PMR4
Locus DMR6

GENI-S

PMR4

Powdery Mildew Resistance 4

DMR6

Downy Mildew Resistance 6

Ruiling LI



Valerio Pompili



Martina Ferrero



PEPERONE

Cuneo
California Wonder



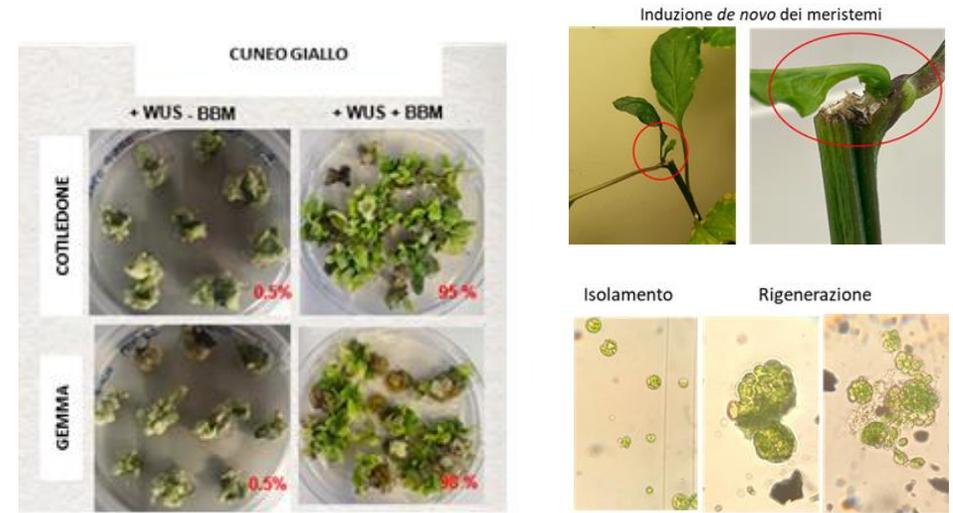
SETUP

- Trasformazione & Rigenerazione
- Ribonucleoprotein (RNP)
- Induzione editing su germogli

GENI-S

Mlo1 - Mildew Locus O

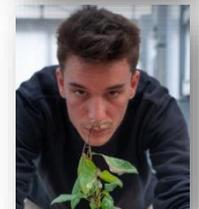
EDITING



Cinzia Comino



Valerio Pompili



Acknowledgements

- Sergio Lanteri
- Cinzia Comino
- Andrea Moglia
- Valerio Pompili
- Alex Maioli
- Ruiling Li
- Martina Ferrero
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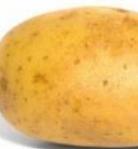
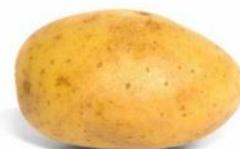
- Yuling Bai
- Yan Zhe



- Cristiano Carli



- Roberto Abellonio
- Simone Monge
- Francesca Dalmasso
- Michael Infantino



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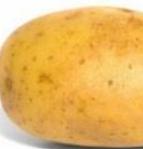
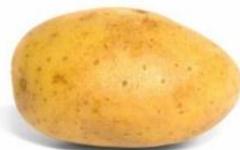
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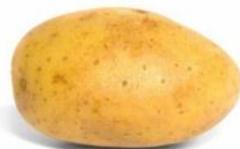
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Grazie per l'attenzione!



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