

EFFECT OF FIELD PLANT COVERAGE ON VIRUS INFECTION OF SEED POTATO (*Solanum Tuberosum* L.) TUBERS IN TWO ITALIAN UP- LAND ENVIRONMENTS

B. Parisi¹, F. Nicoletti¹, D. Pacifico¹

¹Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria, Centro di Ricerca Cerealicoltura e Colture industriali (CREA-CI), Via di Corticella 133, 40128 Bologna, Italy. ²Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria, Centro di Ricerca Difesa e Certificazione (CREA-DC), Via C. G. Bertero 22, 00156 Roma, Italy. ³Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria, Centro di Ricerca Cerealicoltura e Colture Industriali, Via Stezzano 24, 24126 Bergamo, Italy.

Experimental trial 2021

[✉ daniela.pacifico@crea.gov.it](mailto:daniela.pacifico@crea.gov.it)

2 varieties

Desirée (NL, class E, max 1% virus)  Kennebec (DK, class E, max 2% virus) 

Differences in certified maximum virus presence in tuber seed, susceptibility to potato viruses

2 multiplication techniques

open field  plant coverage by non-woven fabric/ insect-proof tunnel

Different protection towards aphids, the main transmission mode of potato viruses

2 areas

Romagnese, PV (800 m asl)  Madesimo, SO (1550 m asl) 

Different temperatures influencing aphid presence

Post-harvest storage and analysis



3/12/2021

Post-harvest storage in half-light, in wooden boxes at room temperature to promote sprouting.



20/01/2022

DAS-ELISA analyses on tuber sprouts for the presence of potato virus Y (PVY), potato virus S (PVS) and potato leafroll virus (PLRV). 60 tubers analysed each group, total 720 samples.

Results

PVY

Overall incidence 99/720 (13.75%); statistically significant differences between techniques for Kennebec in both areas.

Var. Desirée

Var. Kennebec

Area	Technique	PVY incidence
PV	open field	10/60 (16.7%)
PV	coverage	7/60 (11.7%)
PV	coverage-early removal	10/60 (16.7%)
PV	tunnel	5/60 (8.3%)
Chisq. Statistics 2.5962		p-value 0.4581 (n.s.)
SO	tunnel	0/60 (0%)
SO	coverage	0/60 (0%)
SO	open field	0/60 (0%)

Area	Technique	PVY incidence
PV	open field	53/60 (88.3%)
PV	coverage****	16/60 (26.7%)
Chisq. Statistics 46.6837		p-value < 0.00001
SO	tunnel	1/60 (1.67%)
SO	coverage	1/60 (1.67%)
SO	open field*	6/60 (10.0%)
Chisq. Statistics 6.5407		p-value 0.0380

PVS

Detected only in Kennebec, PV, open field, incidence 11.7%. Statistically significant differences between open field and coverage.

Var. Kennebec

PLRV

Not detected

Conclusions

- **PV area is not suitable** to maintain low virus incidence in tuber seed (high risk of aphid flights); coverage is useful.
- **SO area is fit** for cropping virus-free tuber seed (**no or very low aphid flights, no cross-infection** from neighbouring potato crops); coverage is anyway recommended.
- **PVY** is by far the **most prevalent** virus, probably because of cross-infection from neighbouring infected potato crops.

Area	Technique	PVS incidence
PV	open field	7/60 (11.7%)
PV	coverage*	0/60 (0%)
Chisq. Statistics 4.8214		p-value 0.0281

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