

Phthorimaea operculella (Zeller)

*

Phthorimaea operculella.
(80•120•160)

.(°15 5)

0.55 °5 160 °15 6.25

.1

Evaporation storage

Diffused light storage

Ventilated storage

Clamp

.(1998)

7-3

(Bruno, 2003)

Phthorimaea operculella (Zeller)

(Salama et al., 1972)

.(Briese, 1980)

% 100

.(Stephen and Love ,1991)

.(Fuglie et al., 1996) (Chouvalitwongporn, 1993)

*

2004/10/18

.2006/3/27

.% 85 (2000)

) (1998 1995 1985

(2004)

(SAS, 2001) .2

LSD /

0.05 *Solanum tuberosum* L.

(V3, V2, V1)

.3

6/ 1

.1 2002/

°5 Curing

5° .(1989)

V3,V2,V1 3

D3,D2,D1,D0 1° ± 25

240

30 60

.() 72

.(2004)

.2

/

°15 160 120 80

(1) (D3 ,D2 ,D1)

(V1) .(D0)

14.08

12.75 (V2) /

6.25 (V3)

(V3) (V2) (V1)

.T2 T1 1± 5

1± 15

) 30 90

(1±25

V2D3, V2D2 ,						(1)			
	V1D3 , V1D2, V3D3, V3D2			(D0)			(D3)	(D2)	
			9.11						
13.31	V1D1			(D3)	(D2)			0.55	
						(D0)			
				(D1)				18.11	
							(D0)		
V3D3, V2D3,								16.33	
V2D1	V1D3					(1)			
.% 88.11				(D3)	(D2)				
V3D3,V3D2,V2D3, V2D2,				0.00	3.33				
V1D1	V1D3, V1D2				(D0)				
.% 87.22				9.22					
							(D1)		
	.3						(D0)		
								13.33	
	(3)								
							(D3)	(D2)	
(D0)	(D3)	160			(D0)				
		% 21.42					(D1)	80	
	(D1)	80		(1)					
		% 85.49	% 78.34				(D3)	(D2)	
					% 81.61	49.49			
					(D1)	80		(D0)	
% 4.87	(D2)					(D3)	(D2)	% 0.00 39.98	
	(D0)								
					(D3)	(D2)			
		% 73.82					(D1)	(D0)	
					(D3)			% 64.39 39.05	
					(D0)	(2)			
								V1D3	
(D3)	(3)			V2D0		0.33			
% 100									
	(D0)							24.33	
								% 28.57	
	(D1)	80							
		% 12.07	% 21.66					V3D3,V2D3,V1D3	
		(D3)	160				V1D1	V2D0	V2D1
							15.33	15.33	17.33

(3)

(D3) (D2)

% 100 (D0) (3)

.% 16.67 (D1)

(3) % 2.56 (D1)

.% 61.02 (D0)

% 83.33 (D1) (D3) (D2)

(D0)

% 100 (3)

(D3) (D2) % 97.43 (D2)

(D1)

(D3) (D2) (3) (D0) %38.98

(D3)

(D1) % 2.56 (D2)

(D0) (D0) % 24.98

.% 64.78 % 63.22 (D3)

:(1)

*15

(%)		(%)			
27.93	4.50	33.36	6.41	14.08	V1
26.91	4.08	48.75	9.00	12.75	V2
22.74	1.58	46.20	4.00	6.25	V3
N.S.	2.30	7.63	3.77	5.11	LSD 0.05
39.05	4.44	49.49	9.22	18.11	D0
39,64	9.11	81.61	13.33	16.33	D1
0.00	0.00	39.98	3.33	9.11	D2
0.00	0.00	0.00	0.00	0.55	D3
13.30	2.66	8.81	4.35	5.91	LSD 0.05

:(2)

*15

(%)	(%)					
24.52	29.04	4.66	5.33	18.66	D0	V1
87.22	75.02	13.33	15.33	20.33	D1	
0.00	29.40	0.00	5.00	17.00	D2	
0.00	0.00	0.00	0.00	0.33	D3	
46.49	59.68	5.66	15.33	24.33	D0	V2
61.15	88.11	10.66	17.33	19.66	D1	
0.00	47.22	0.00	3.33	6.33	D2	
0.00	0.00	0.00	0.00	0.66	D3	
46.15	59.76	3.00	7.00	11.33	D0	V3
44.15	71,81	3.33	7.33	9.00	D1	
0.00	43.33	0.00	1.66	4.00	D2	
0.00	0.00	0.00	0.00	0.66	D3	
15.3	13.02	3.63	6.88	9.44		LSD 0.05

:(3)

LSD 0.05	D3	D2	D1	D0	()
16.24	21.42	61.47	85.49	78.34	
11.05	100	28.57	12.07	21.66	
7.45	4.76	4.87	1.02	0.00	
8.34	73.82	5.09	1.42	0.00	
14.61	0.00	0.00	2.56	61.02	
14.58	0.00	100	97.43	38.98	
28.83	0.00	0.00	16.67	100	
28.83	0.00	0.00	83.33	0.00	
27.10	0.00	24.98	52.51	63.22	
11.39	0.00	0.00	2.56	64.78	

160

Saour and) (1985)

(Makee, 2004

(2004)

(Fenemore, 1980)

First instar

°5

(Kader, 1988)

Foot,)
)

°5

(1976
(1985

°5

.(1998 1995)

160

120

1987)

.(2001
160

1980

.(2004 1998)

Horne and)

1998

1995

Brownell, 1962

.(2004

160

(Maggot)

.(2004 2004 1998)

)

.(2004

1998

1995

.()
(T2) °15

.(Cornwell, 1959)

-200

(1985)

250

- 1980
()
- .905 2001
(*T. granarium*)
- Briese, D.R. 1980. Characterization of a Laboratory Strain of the Potato Moth, *Phthorimaea operculella* (Zeller). (Lepidoptera Gelechiidae). *Bull. Ent. Res.*, (70): 203-212. () 1998
- Bruno, M.D. 2003. *Post Harvest and Storage Pests: Insects and Mites*. Natural Resources Institute. University of Greenwich, Food Security Department.UK. .141 1998
- Chouvalitwongporn, P. 1993. Management of Potato Tuber Moth *Phthorimaea operculella* (Zeller) in Potato Seed Storage in Thailand. 1995 .237
- Cornwell, P.B. 1959. The Disinfestation of Food Particularly. *Intern. J. Irradiation and Isotopes*: 93-188. 1989
Solanum tuberosum.
- Fenemore, P.G. 1980. Susceptibility of Potato Cultivares to Potato Tuber Moth *Phthorimaea operculella* Zeller. (Lepidoptera: Gelechiidae). *New Zealand Journal of Agriculture Research*, 23: 239-546. .84-75 :(1) 8
2004
- Foot, M.A. 1976. Susceptibility of Twenty Potatoes Cultivares to the Potato Tuber Moth at Pukekoha Preliminary Assessment. *N.Z.J. Exp. Agric*: 4:239-242. " 1987 . . "
- Fuglie, K., Ben Salah, H., Essamet, M., Ben Temima, A. and Rahmouni, A. 1996. Economic Impact of IPM Practices on the Potato Tuber Moth in Tunisia. Economic Impact of CIP-Related Technologies. International Potato Center Lima, Peru. .411 () " 2004
()
2000
- Horne, T. and Brownell, L.E. 1962. The Use of Radiation Sources for Insect Control. *IAEA*, Vienna: 233-250.
- Kader, A.A. 1988. Gamma Irradiation of Horticulture Crop. Perishable Handling Issue. University of California Extension. USA. (5): 2-5. 1985 10-1 :
- Salama, H.S., Dimetry, N.Z. and Sharaby, A.M. 1972. Contribution to the Biology of the Potato Tuber Moth *Phthorimaea operculella* (Zeller) in Egypt. *Bull. Soc. Ent.* (61): 61-68. 1985
- SAS Institute. 2001. *ASA Guide for Personal Computer*, Version, Ed. SAS Institute Inc., Gary, NC, USA. 2003
- Saour, H. and Makee, H. 2002. Effects of Gamma Irradiation Used to Inhibit Potato Sprouting on Potato Tuber Moth Eggs *Phthorimaea operculella* (Zeller). *J. Baracon hebetor* (Say) (*Hymenoptera: Braconidae*) -

Stephen, L. and Love, M. 1991. Cultural Management of Ranger Russet Potatoes. Department of Plant , Soil and Entomological Sciences ,University of Idaho, Moscow, Idaho. USA.

Appl. Ent., 126: 315-319.
Saour, G. and Makee, H. 2004 Susceptibility of PTM, *P. operculella* (Zeller) to Post Harvest Gamma Irradiation *J. Econ. Entomol.*, 97(2): 711-714.

Effect of Potato Variety, Temperature of Storage and Gamma Rays on the Development of Infestation by *Phthorimaea operculella* (Zeller) in Potato Tuber *Solanum tuberosum* L.

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ABSTRACT

The effect of potato variety, temperature and gamma rays on development of infestation by potato tuber moth *Phthorimaea operculella* (Zeller) in potato tuber *Solanum tuberosum* L. was studied. Artificial infestation by PTM was carried for the three varieties (Desiree, Diamant and Romano), then the varieties were exposed to three doses of gamma rays (80, 120, 160 Gray in addition to the control), then stored at two different temperatures (5, 15°C). The results of this investigation showed that the variety Romano illustrated significantly the lowest average number of larvae which was 6.25 in its tuber in comparison with the other two varieties. Furthermore, temperature 5°C reduced the number of living larvae to zero in all varieties studied during the storage and adaptation periods which were four months. The dose 160 Gray of gamma radiation decreased the number of surviving larvae to 0.55 when the potato tuber was stored at 15°C.

KEYWORDS: *Phthorimaea operculella* ; gamma rays, storage temperature.

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