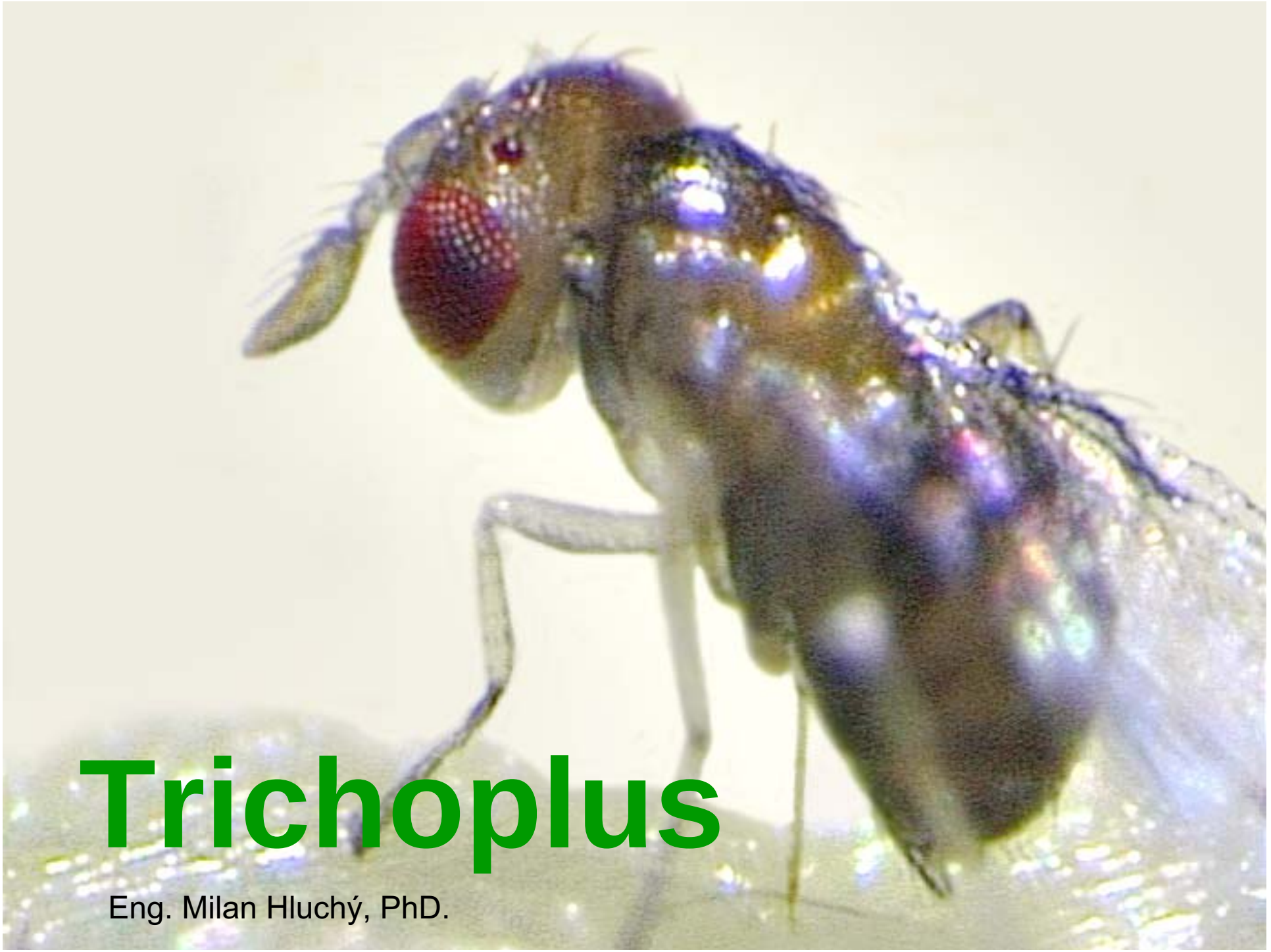
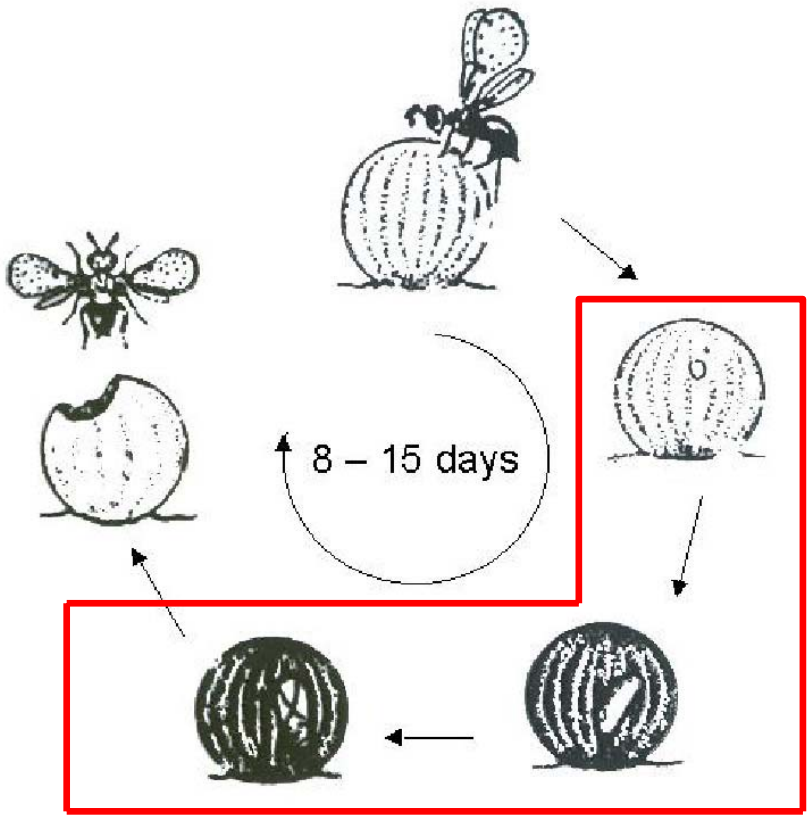


Trichoplus

Eng. Milan Hluchý, PhD.



The Trichoplus®
consists of a mixture of eggs, larvae, praepupae and pupae of the species, Trichogramma pintoi.

The mixture of eggs, larvae, praepupae and pupae of T. pintoi is placed in small light polystyrene capsules.

The capsules protect the eggs against adverse climatic conditions and predators such as ants, etc.

Biocont Laboratory

The cotton bollworm (Helicoverpa armigera)

The cotton bollworm is a serious pest of many kinds of vegetables.

Pheromone traps – monitoring of the cotton bollworm.

Dosage:

Helicoverpa armigera
– tomato 2–3 x 150 caps/gen/ha
– red pepper 2–3 x 150 caps/gen/ha

Biocont Laboratory

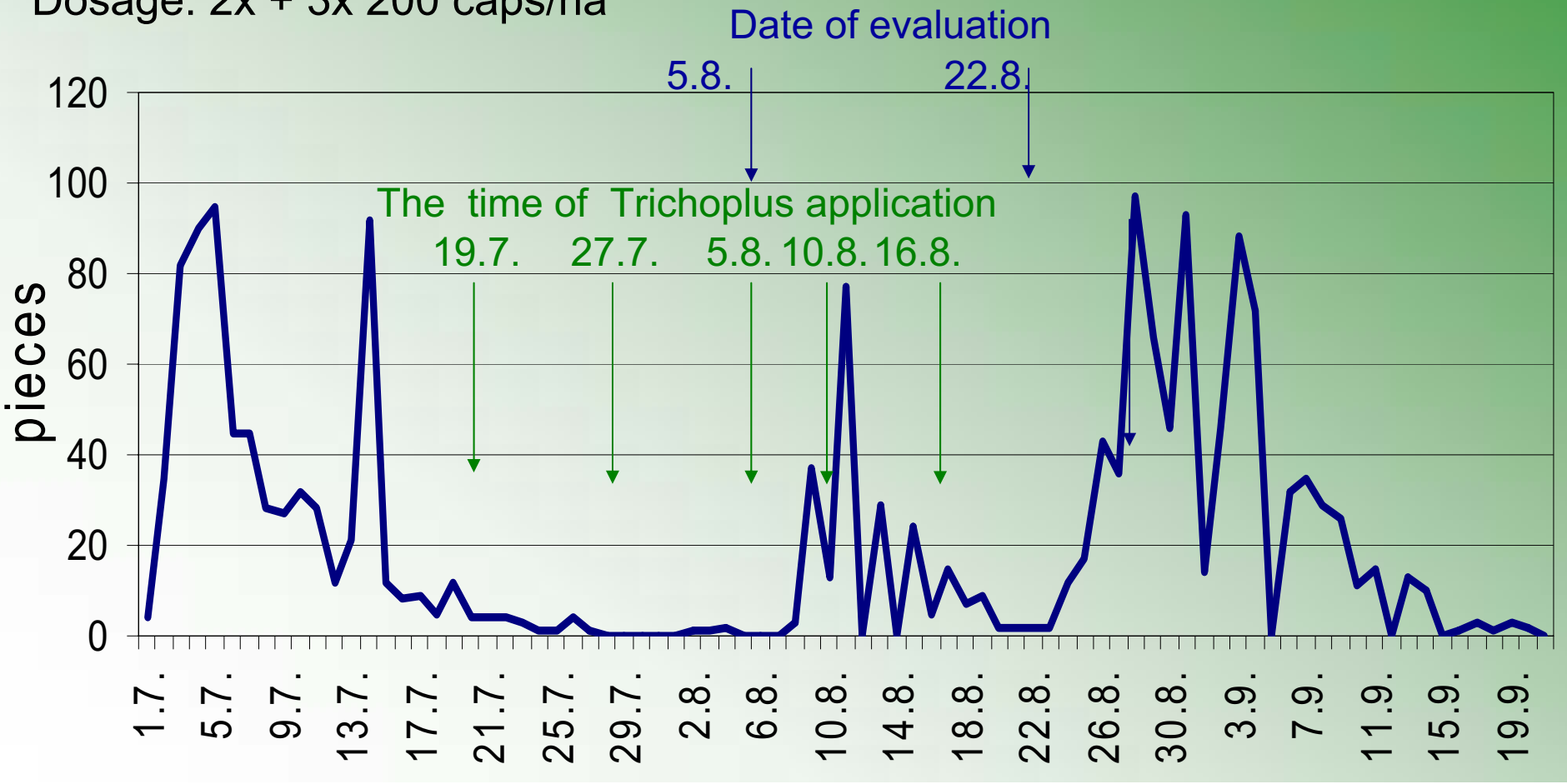
Crop: Tomato - in greenhouse

Locality: Hungary, Velence, 2002

Pest: Cotton bollworm *(H. armigera)*

Date of treatment: 19.07; 27.07; 05.08; 10.08; 16.08.

Dosage: 2x + 3x 200 caps/ha



Biocont Laboratory

Effect of Trichoplus on the cotton bollworm in tomato – in greenhouse

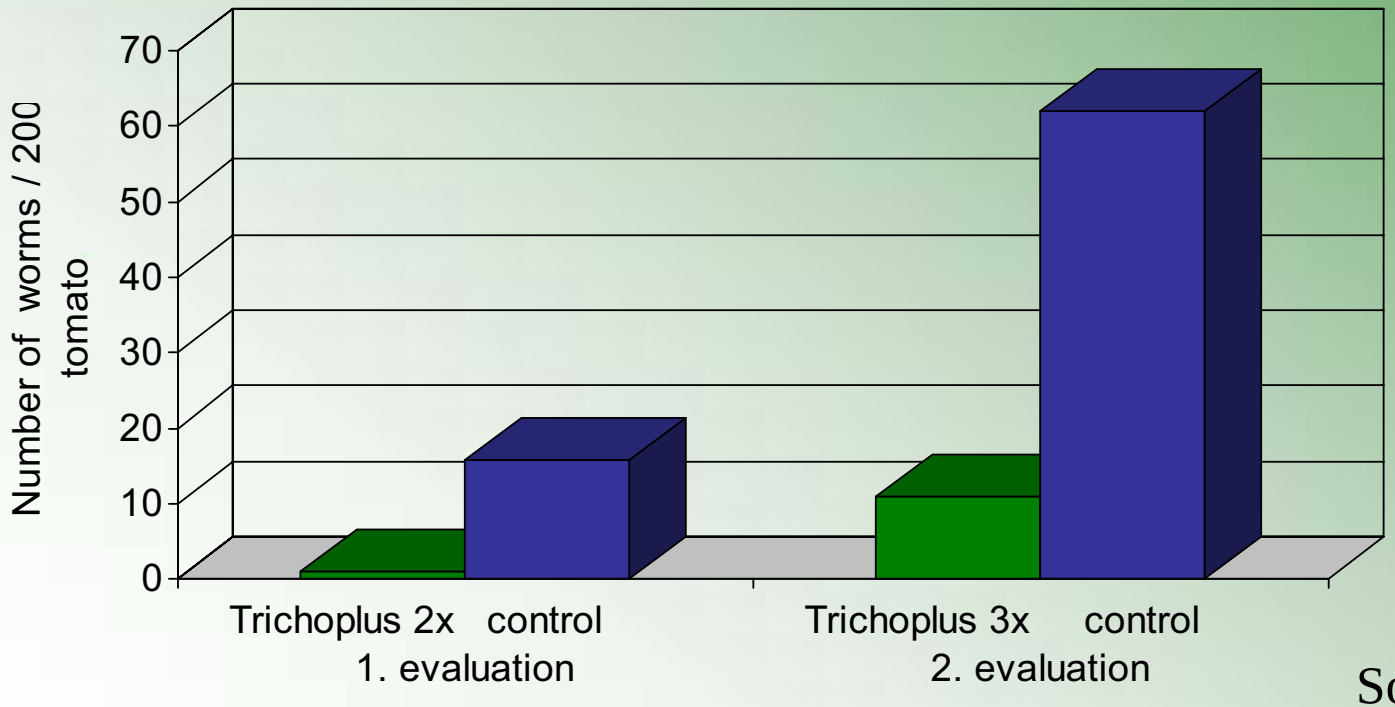
Locality: Hungary, Velence, 2002 Dosage:2x + 3x 200 caps/ha

Date of treatment: 19.07; 27.07; 05.08; 10.08; 16.08.

Dateb of evaluation: 05.08., 22.08.

Efficacy: 1. evaluation 93,8 %
2. evaluation 82,2 %

Evaluated sample: 4x 50 fruits



Source SPA

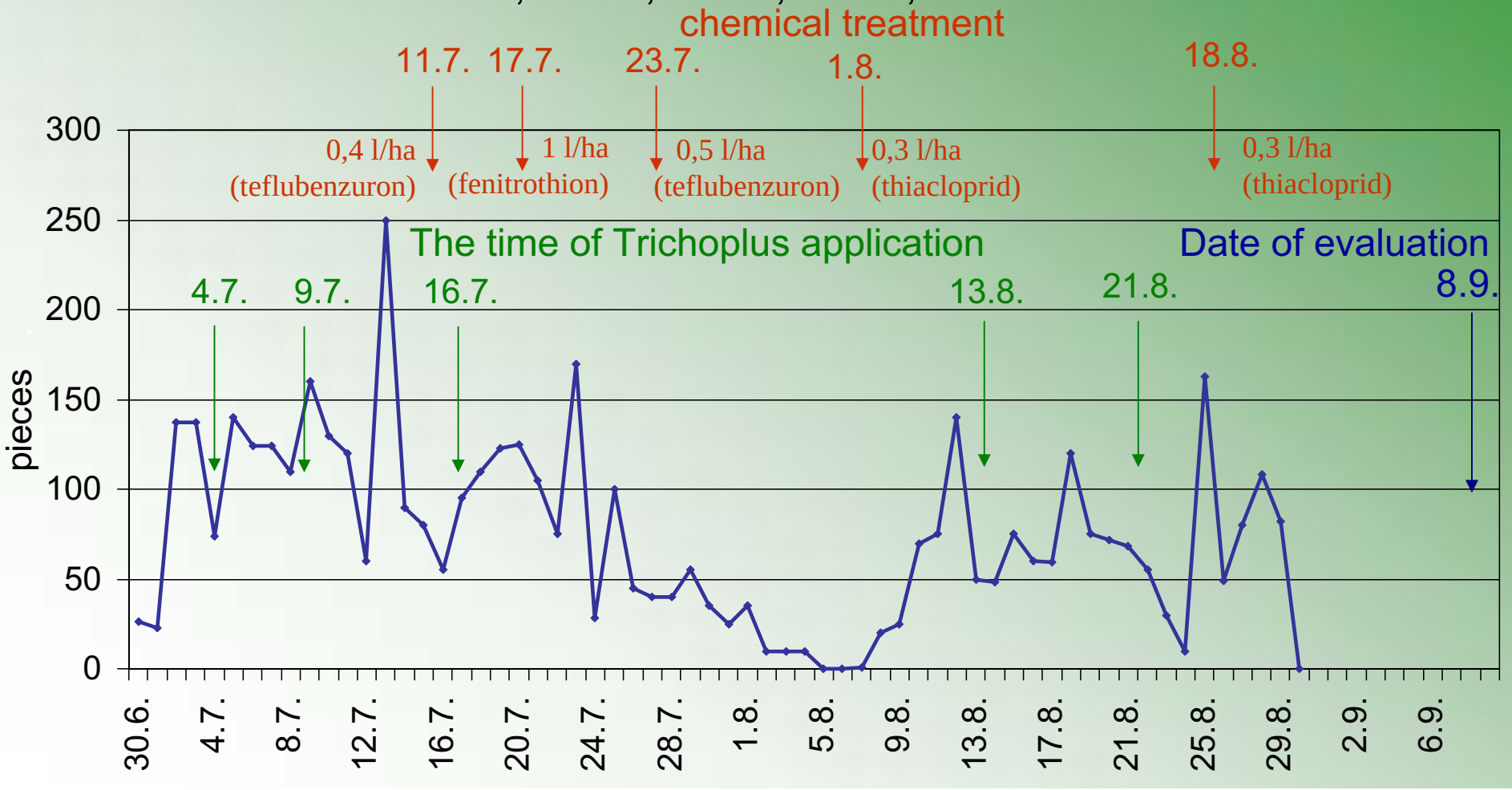
Biocont Laboratory

Crop: Tomato – open field

Locality: Želiezovce, 2003 Dosage: 5 x 150 caps/ha

Pest: Cotton bollworm *(H. armigera)*

Date of treatment: 04.07; 09.07; 16.07; 13.08; 21.08



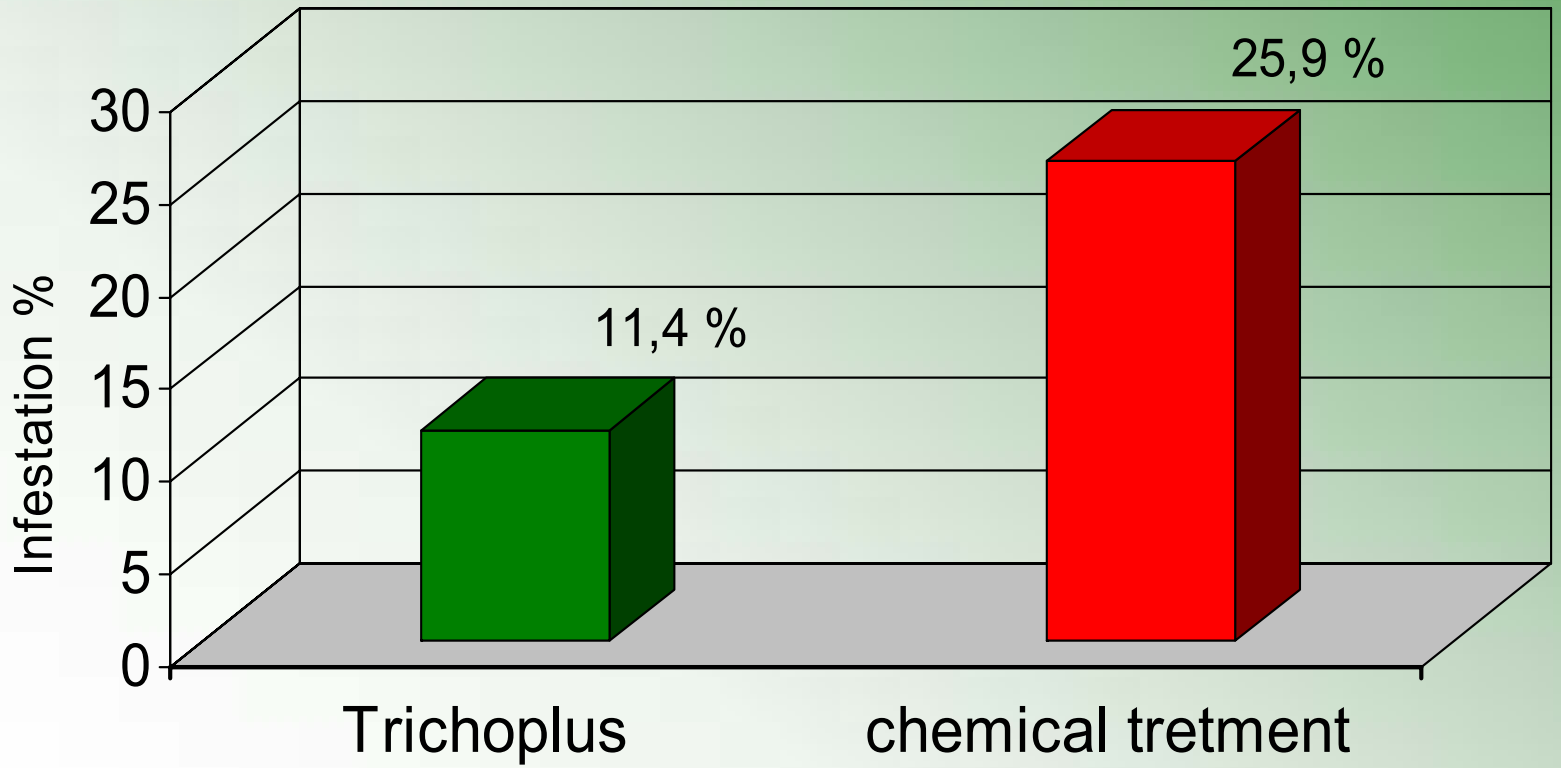
Biocont Laboratory

Effect of Trichoplus on the cotton bollworm in tomato – open field

Locality: Želiezovce, 2003 Dosage: 5 x 150 caps/ha

Date of treatment: 04.07; 09.07; 16.07; 13.08; 21.08

Date of evaluation: 08.09. 2003 Evaluated sample: 3 x 10 plants



Biocont Laboratory

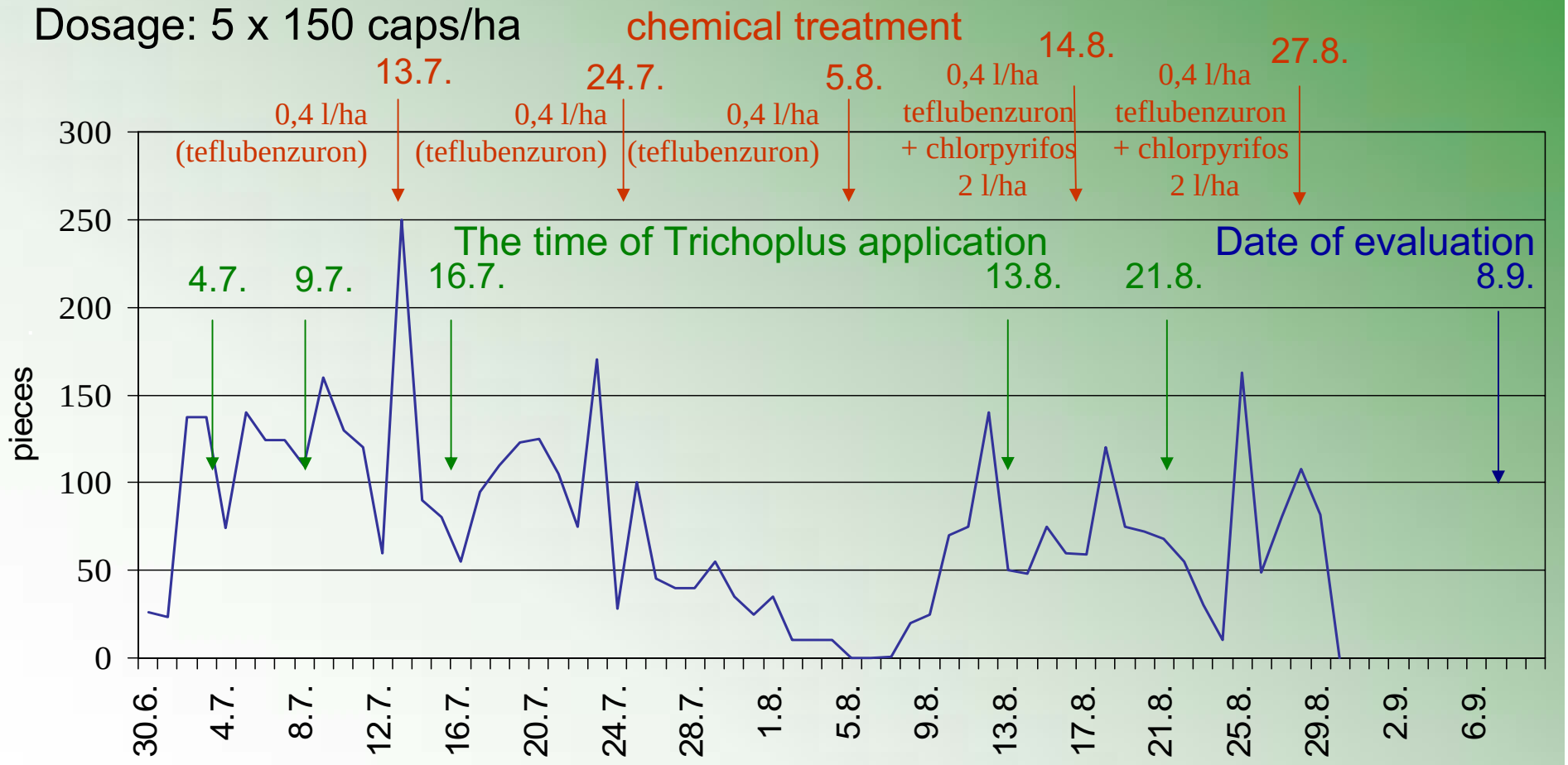
Crop: Tomato – open field

Locality: Vrbová nad Váhom, SK, 2003

Pest: Cotton bollworm *(H. armigera)*

Date of treatment: 04.07; 09.07; 16.07; 13.08; 21.08

Dosage: 5 x 150 caps/ha



Biocont Laboratory

Effect of Trichoplus on the cotton bollworm in tomato – open field

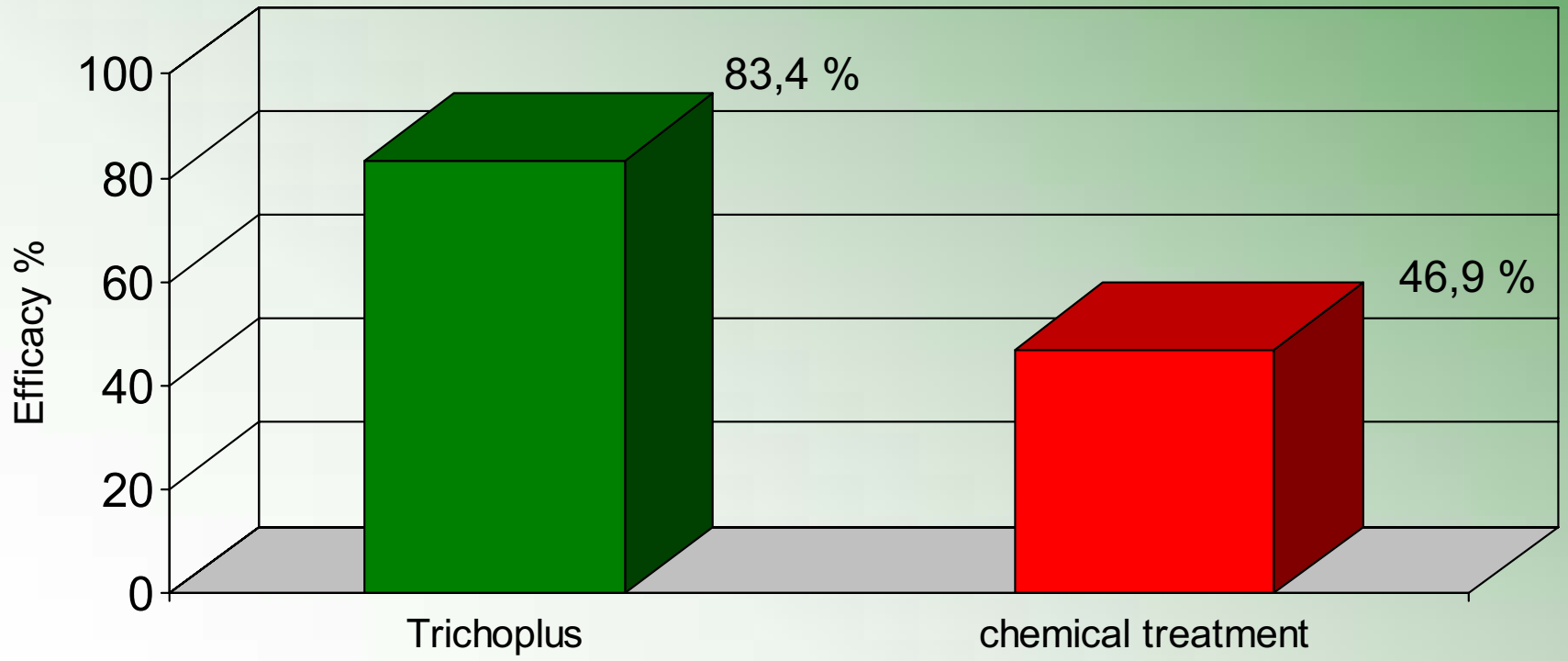
Locality: Vrbová nad Váhom, 2003

Dosage: 5 x 150 caps/ha

Date of treatment: 04.07; 09.07; 16.07; 13.08; 21.08

Date of evaluation: 08.09

Evaluated sample: 10 plants



Biocont Laboratory

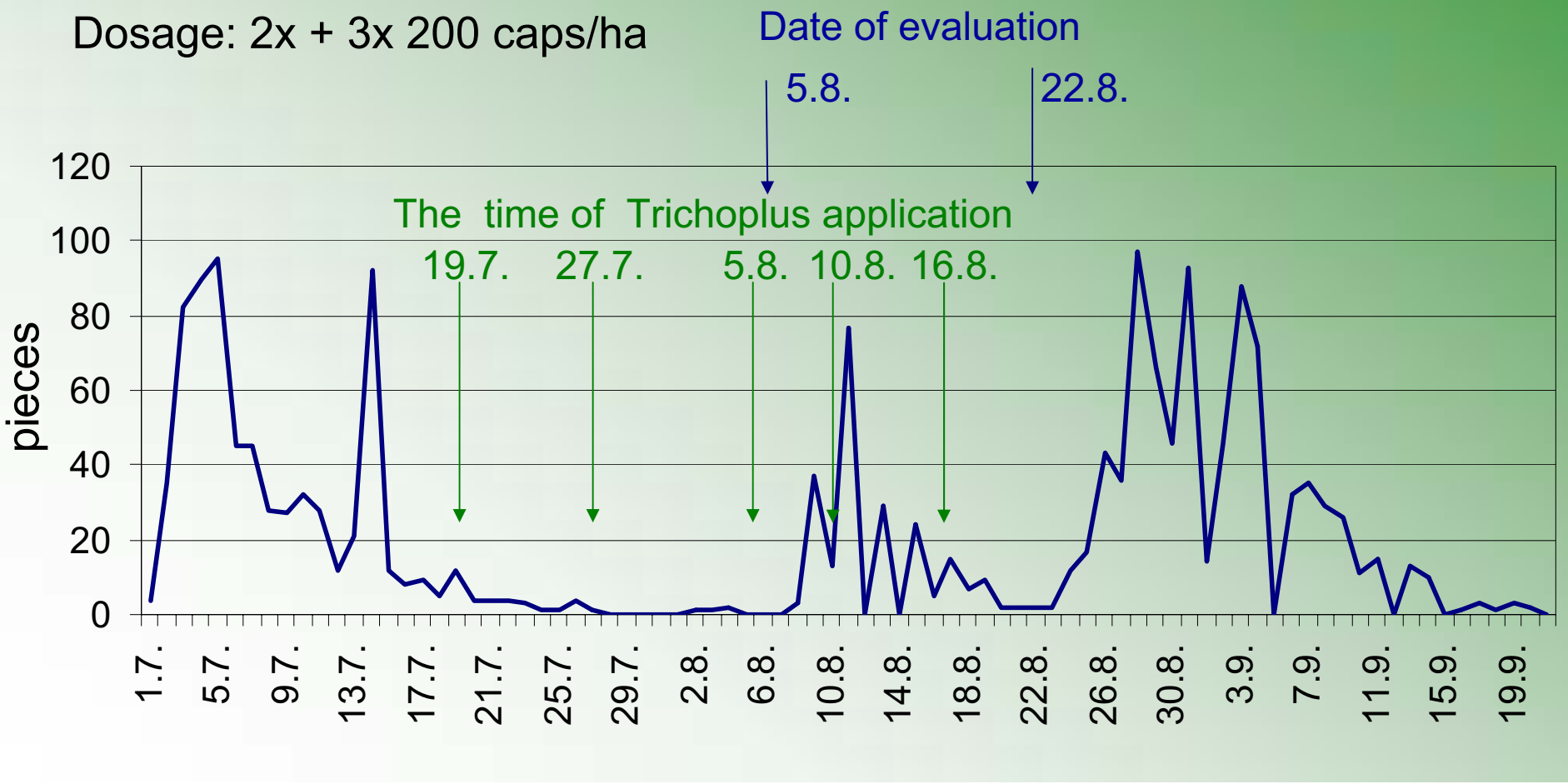
Crop: Pepper – in greenhouse

Locality: Velence, Hungary, 2002

Pest: Cotton bollworm *(H. armigera)*

Date of treatment: 19.07; 27.07; 05.08; 10.08; 16.08

Dosage: 2x + 3x 200 caps/ha



Biocont Laboratory

Effect of Trichoplus on the cotton bollworm in pepper – greenhouse

Locality: Velence, Hungary, 2002 Dosage: 2x + 3x 200 caps/ha

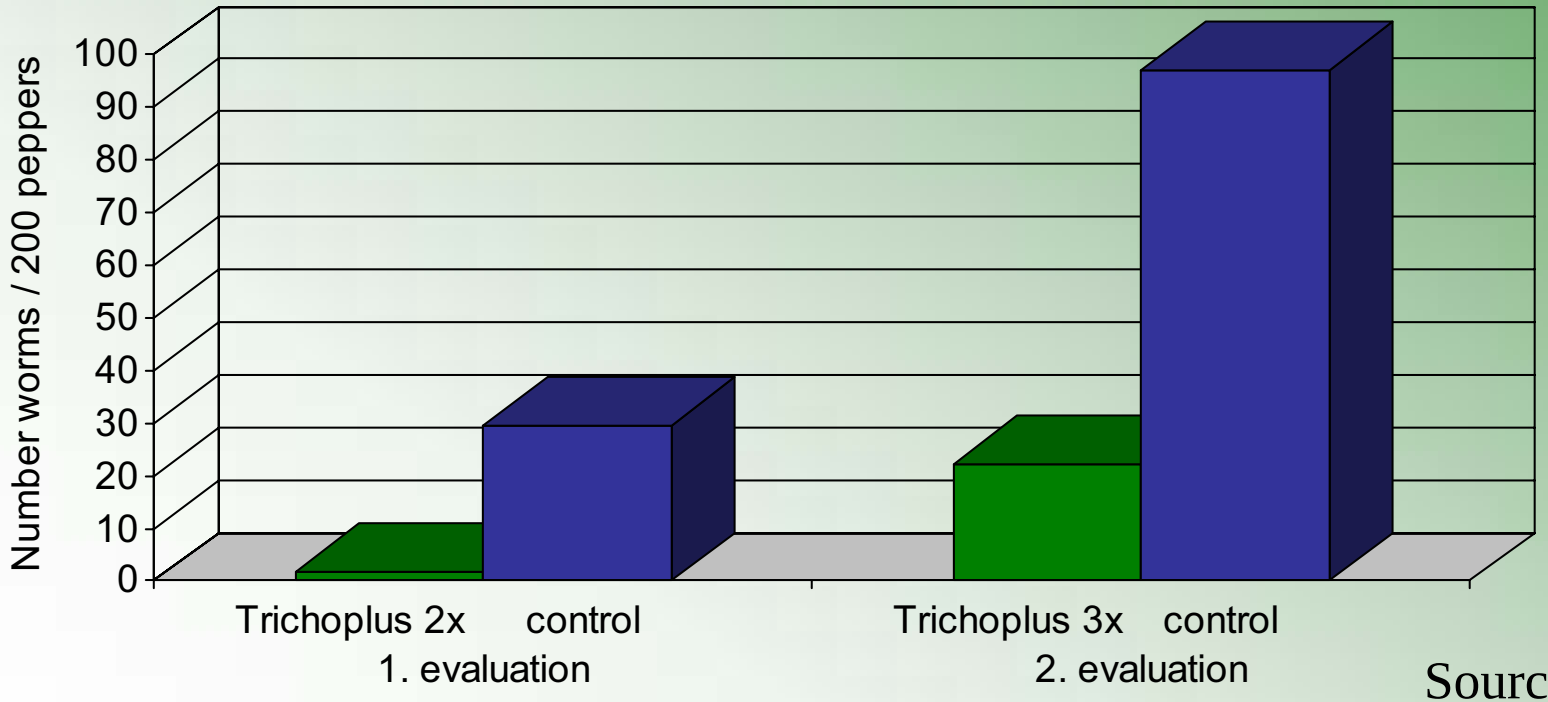
Date of treatment: 19.07; 27.07; 05.08; 10.08; 16.08

Date of evaluation: 05.08., 22.08.

Evaluated sample: 4 x 50 fruits

Efficacy: 1. evaluation - 94 %

2. evaluation – 77,4 %



Source SPA

Biocont Laboratory

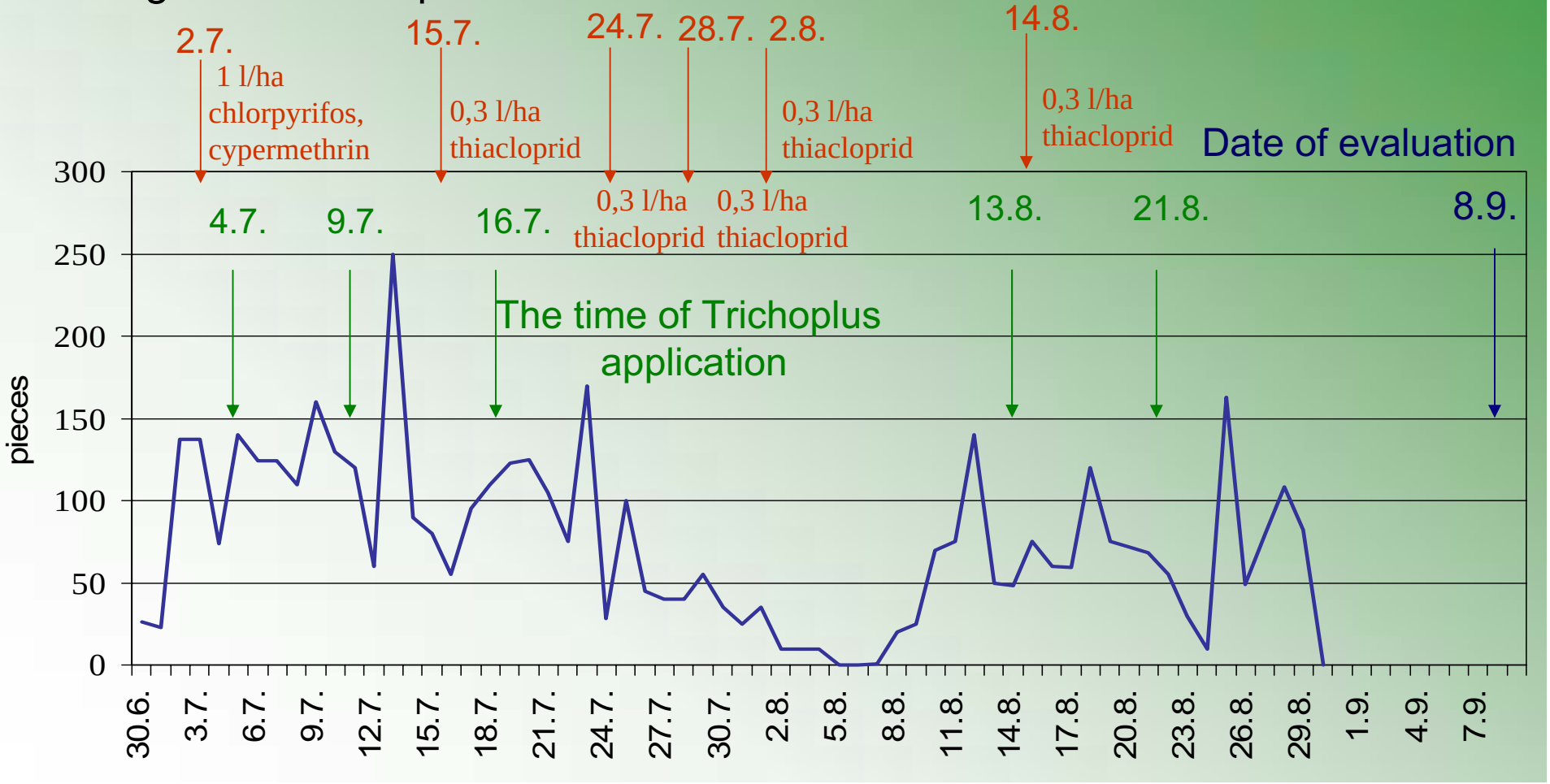
Crop: Pepper (Marka, Flamingo) – open field

Locality: Želiezovce, SK, 2003

Pest: Cotton bollworm *(H. armigera)*

Date of treatment: 04.07; 09.07; 16.07; 13.08; 21.08

Dosage: 5 x 150 caps/ha



Biocont Laboratory

Effect of Trichoplus on the cotton bollworm in pepper – open field

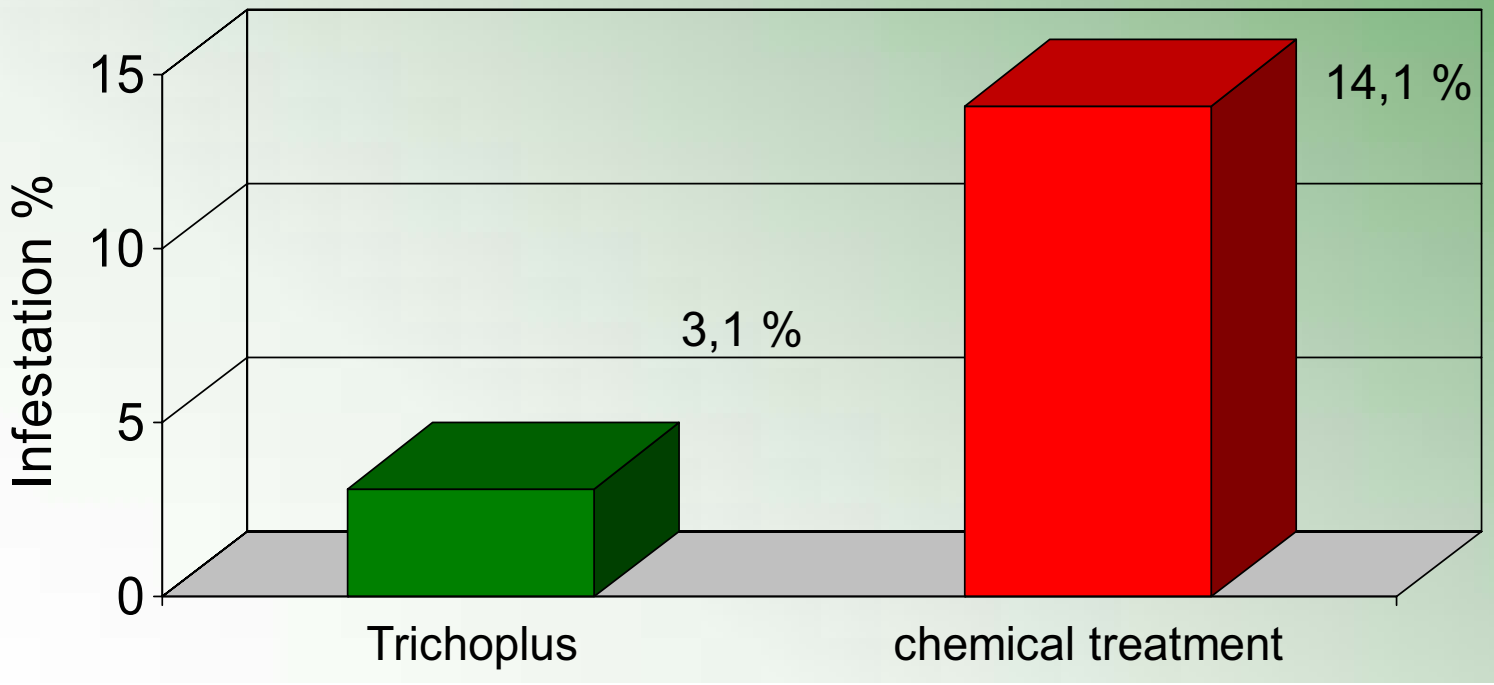
Locality: Želiezovce, SK, 2003

Dosage: 5 x 150 caps/ha

Date of treatment: 04.07; 09.07; 16.07; 13.08; 21.08

Date of evaluation: 08.09.

Evaluated sample: 8 x 10 fruits



Biocont Laboratory

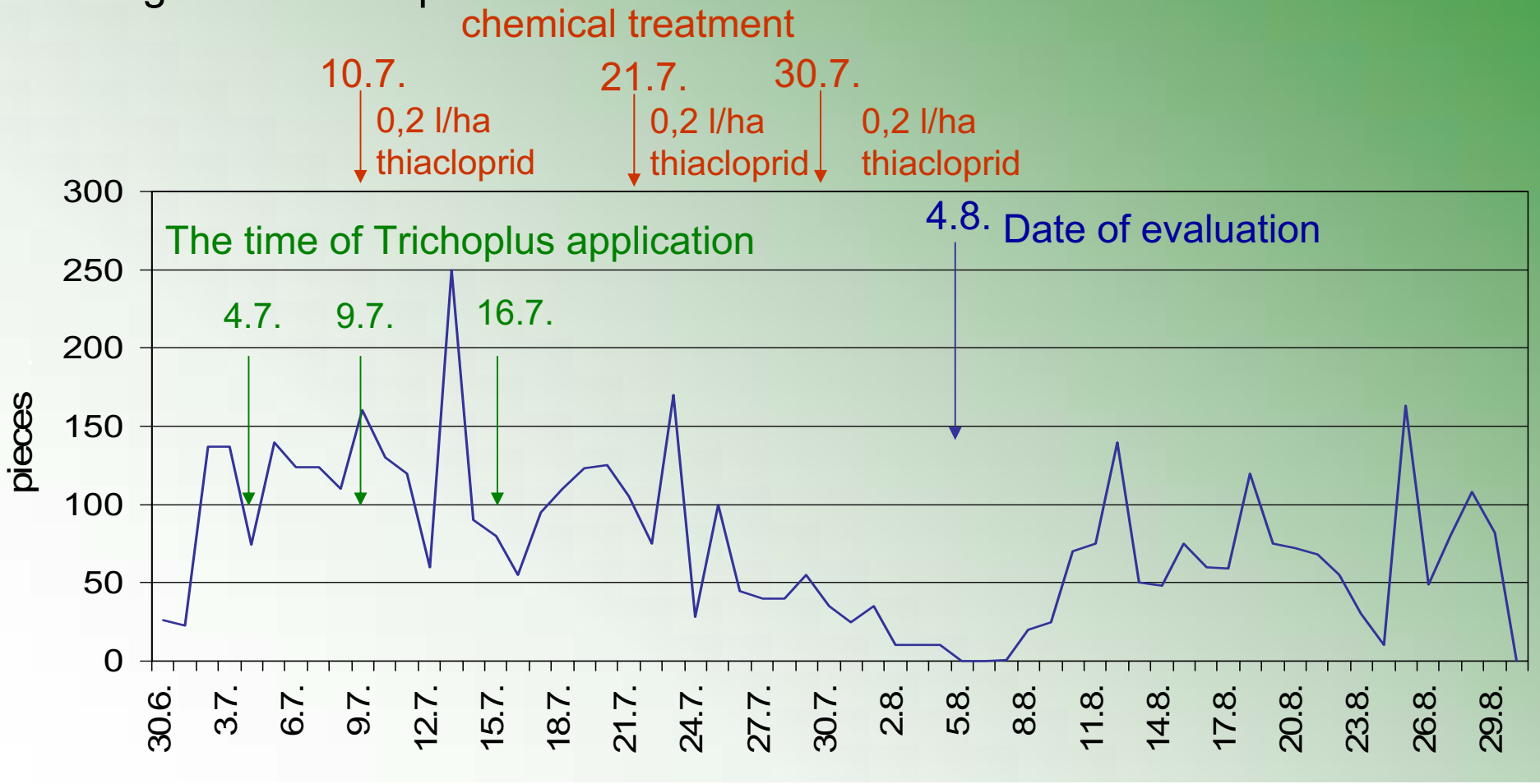
Crop: Pepper – open field

Locality: Marcelová, SK, 2003

Pest: Cotton bollworm *(H. armigera)*

Date of treatment: 04.07; 09.07; 16.07

Dosage: 3 x 150 caps/ha



Biocont Laboratory

Effect of Trichoplus on the cotton bollworm in pepper – open field

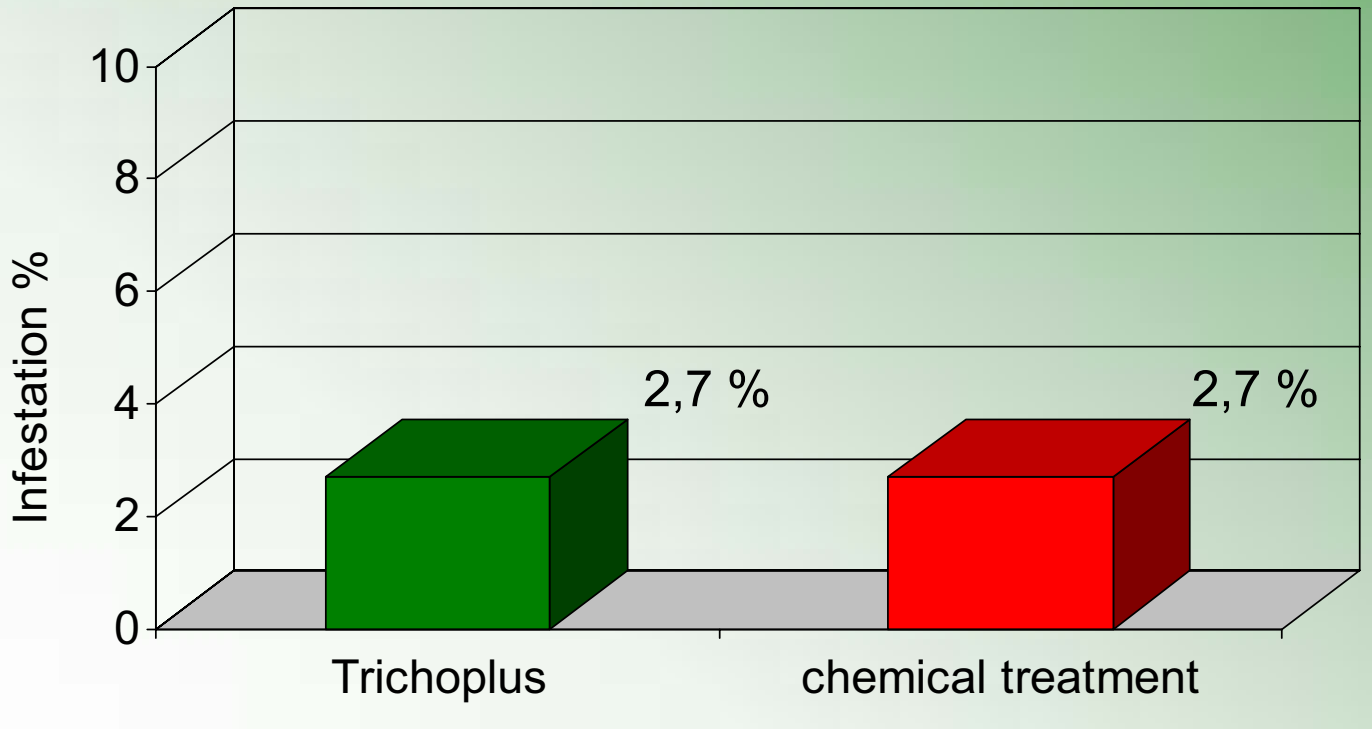
Locality: Marcelová, SK, 2003

Dosage: 3 x 150 caps/ha

Date of treatment: 04.07; 09.07; 16.07

Date of evaluation: 04.08.

Evaluated sample: 6 x 10 fruits



Biocont Laboratory

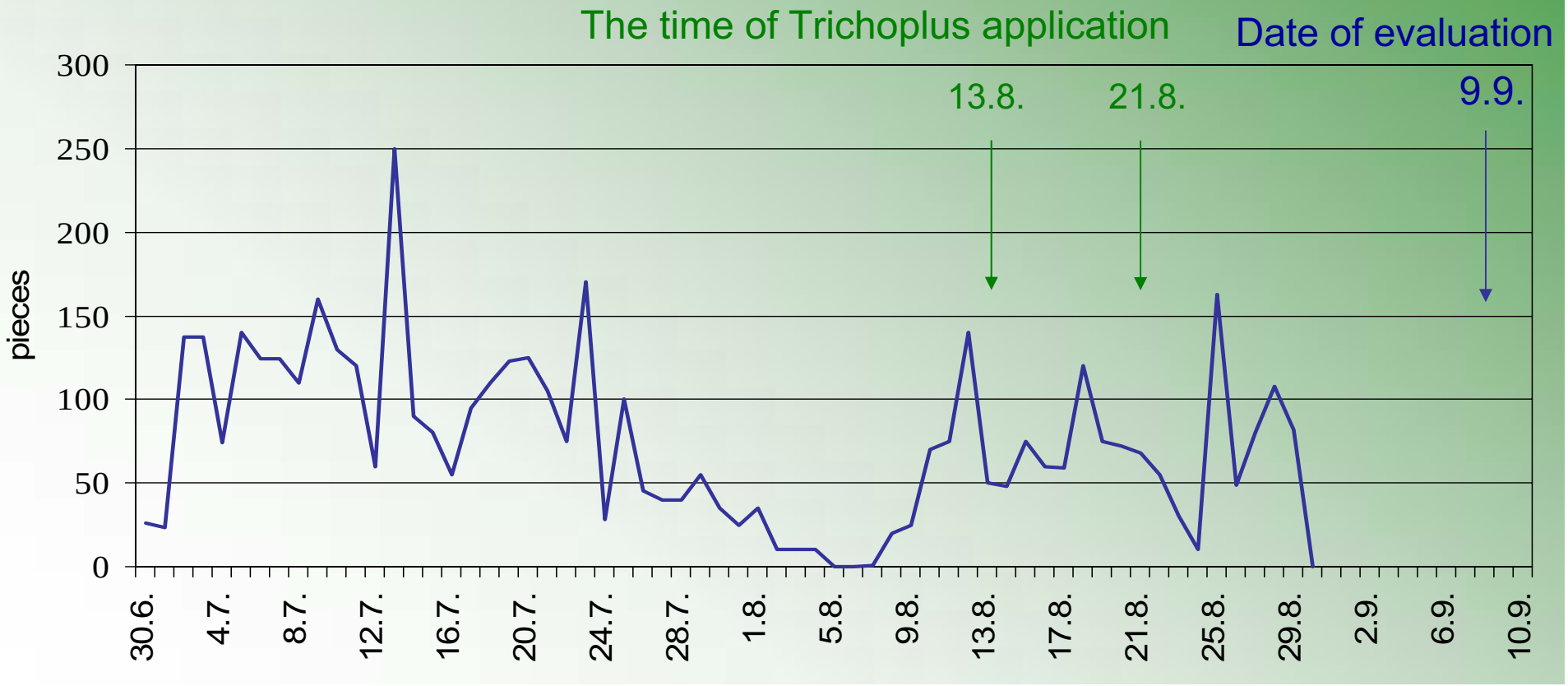
Crop: Pepper – open field

Locality: Marcelová, SK, 2003

Pest: Cotton bollworm *(H. armigera)*

Date of treatment:13.08; 21.08

Dosage: 2 x 150 caps/ha



Biocont Laboratory

Effect of Trichoplus on the cotton bollworm in pepper – open field

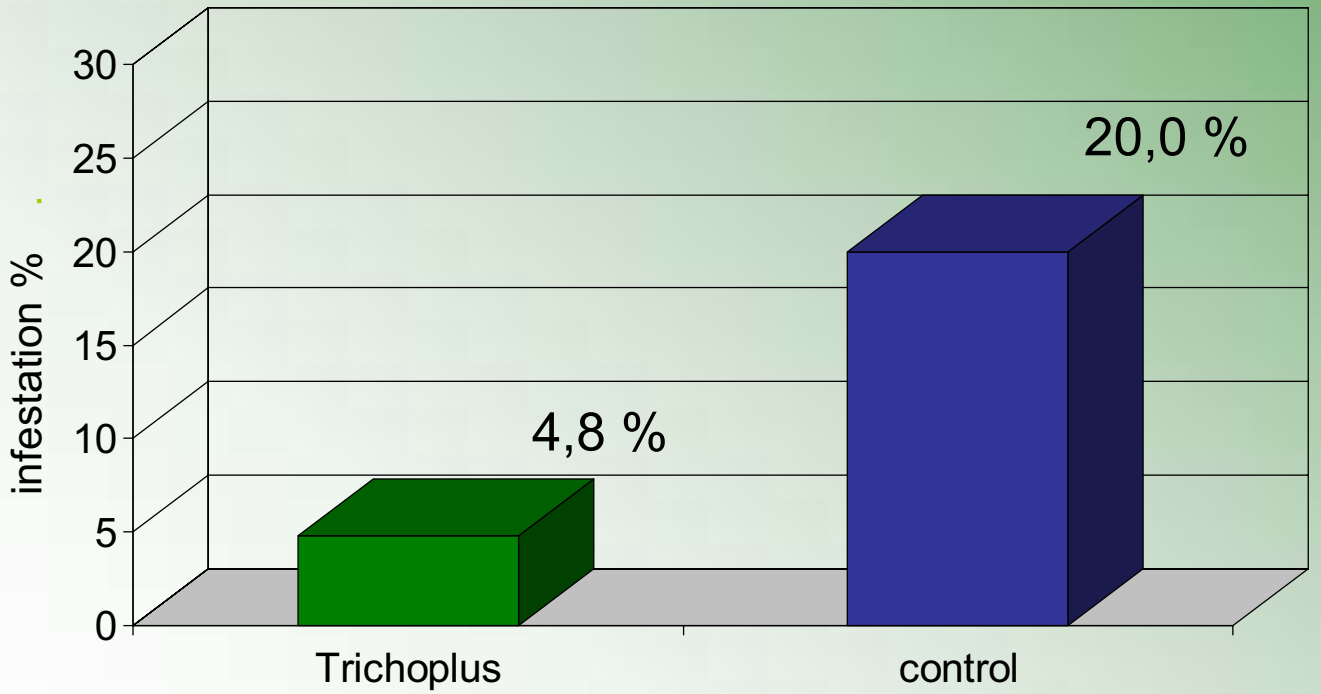
Locality: Marcelová, SK, 2003

Evaluated sample: 10x10 plants

Date of evaluation: 09.09.

Efficacy: 76 %

Dosage: 2x150 caps/ha



Biocont Laboratory

Crop: Tobacco

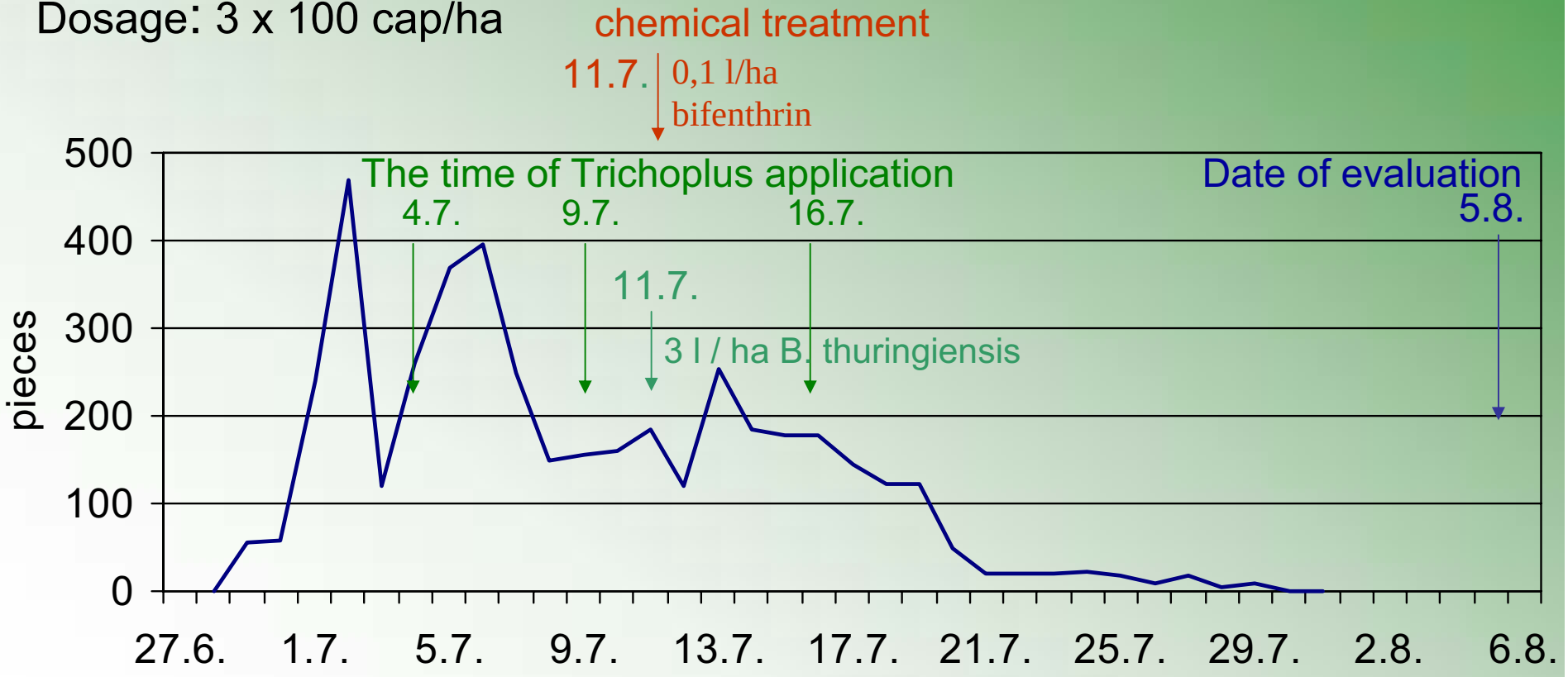
Locality: Bátorové Kosihy, SK, 2003

Pest: Cotton bollworm *(H. armigera)*

Date of treatment: Trichoplus: 04.07; 09.07; 16.07

1 x B. thuringiensis 3l/ha – 11.07

Dosage: 3 x 100 cap/ha



Biocont Laboratory

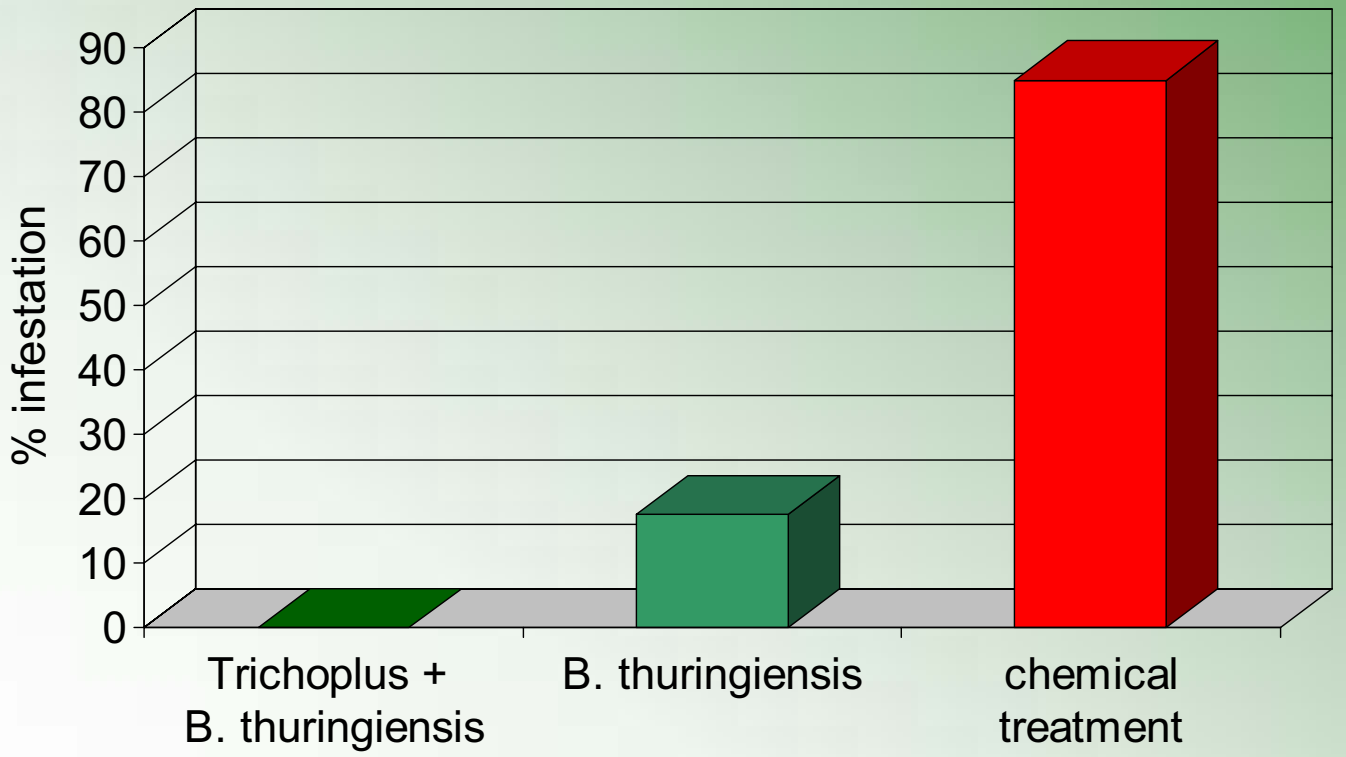
Effect of Trichoplus on the cotton bollworm in tobacco

Locality: Bátorové Kosihy, SK, 2003

Evaluated sample: 4x10 plants

Dosage: 3 x 100 cap/ha, B. thuringiensis 1 x 3 l / ha

Date of evaluation: 05.08.



Advantages of the Trichoplus® capsules

- hitch capsules on plant ensures optimal conditions during the whole hatching of Trichogramma

Advantages of the Trichoplus® capsules

- contains the biological product of the top quality
- efficient protection of beneficial wasps against adverse effect of climate and predators
- advisory support for correct timing of delivery and application is included in the price
- up to 80 % efficacy is reached provided that all recommendations for use are followed
- hitch capsules on plant ensures optimal conditions during the whole hatching of Trichogramma

Biocont Laboratory Ltd.

Šmahova 66, Brno – Slatina, 627 00
Czech Republic

Phone: +420 5 45218156
E-mail: biocont@biocont.cz
www. biocont.cz

hluchy@biocont.cz

The cabbage moths (Mamestra brassicae)

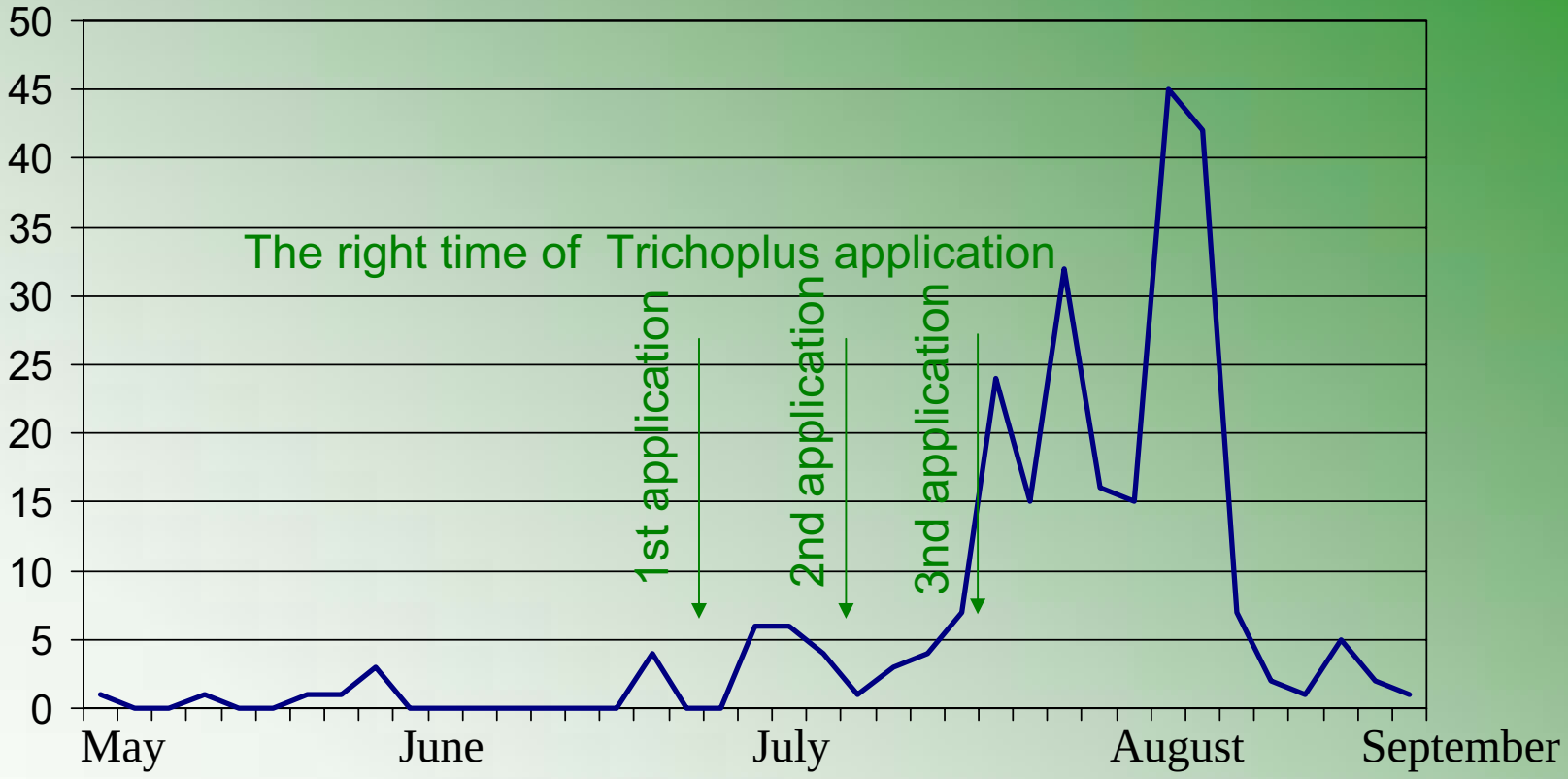
The greatest damage is usually caused by the larvae of the second generation, which are often more numerous than the first generation.

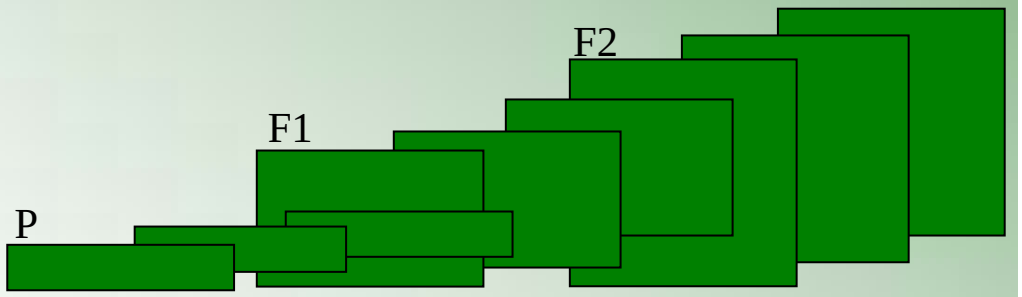
Dosage:

Mamestra brassicae
– cabbage 2-4 x 100 caps/gen/ha

Biocont Laboratory

The flight activity of cabbage moths





P – parental generation
F1, F2 – filial generation

Biocont Laboratory

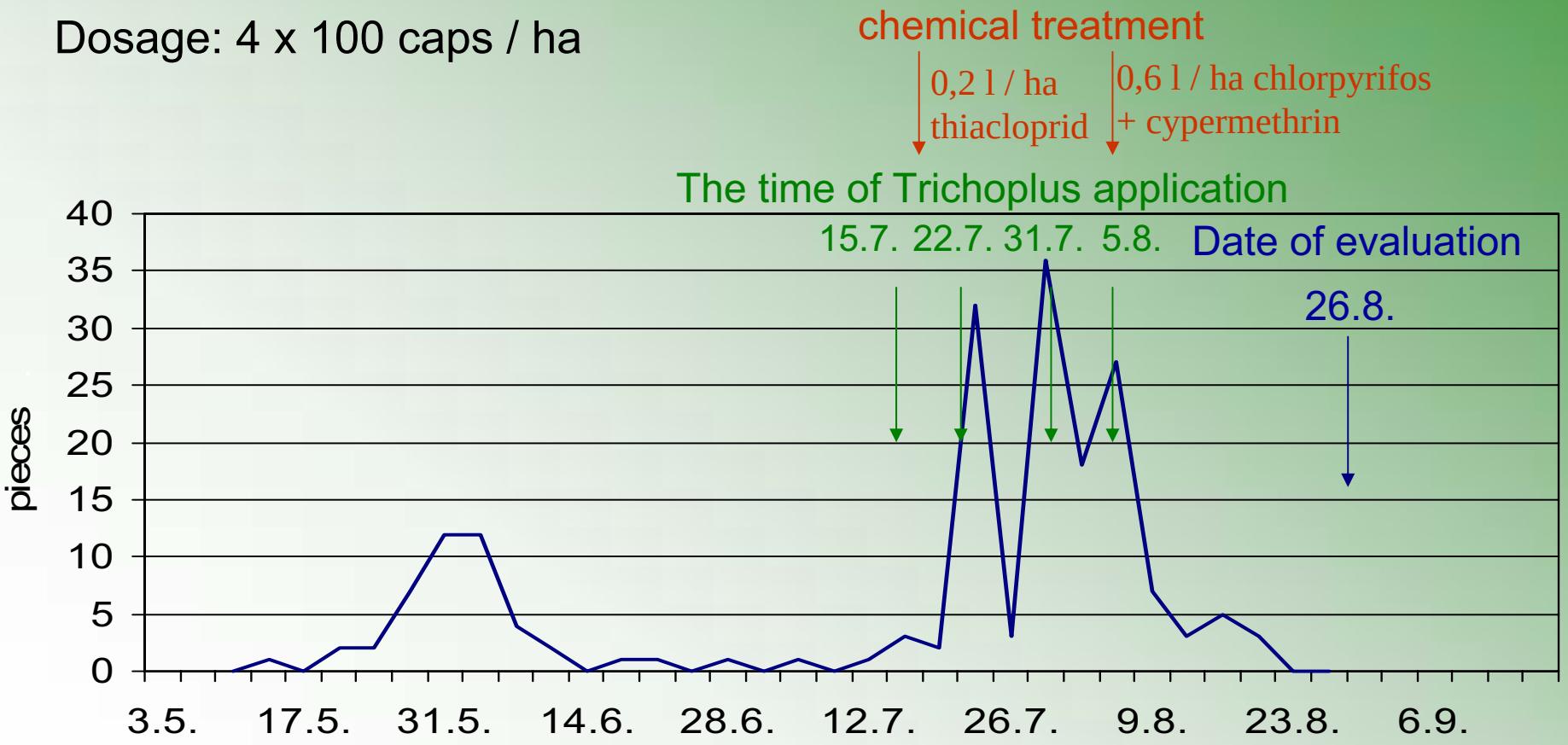
Crop: White cabbage

Locality: Otice, CZ, 2003

Pest: Cabbage moth *(M.brassicae),* Cabbage worm *(P.rapae)*

Date of treatment: 15.07; 22.07; 31.07; 05.08

Dosage: 4 x 100 caps / ha



Biocont Laboratory

Effect of Trichoplus on the cabbage moth in cabbage

Locality: Otice, CZ, 2003

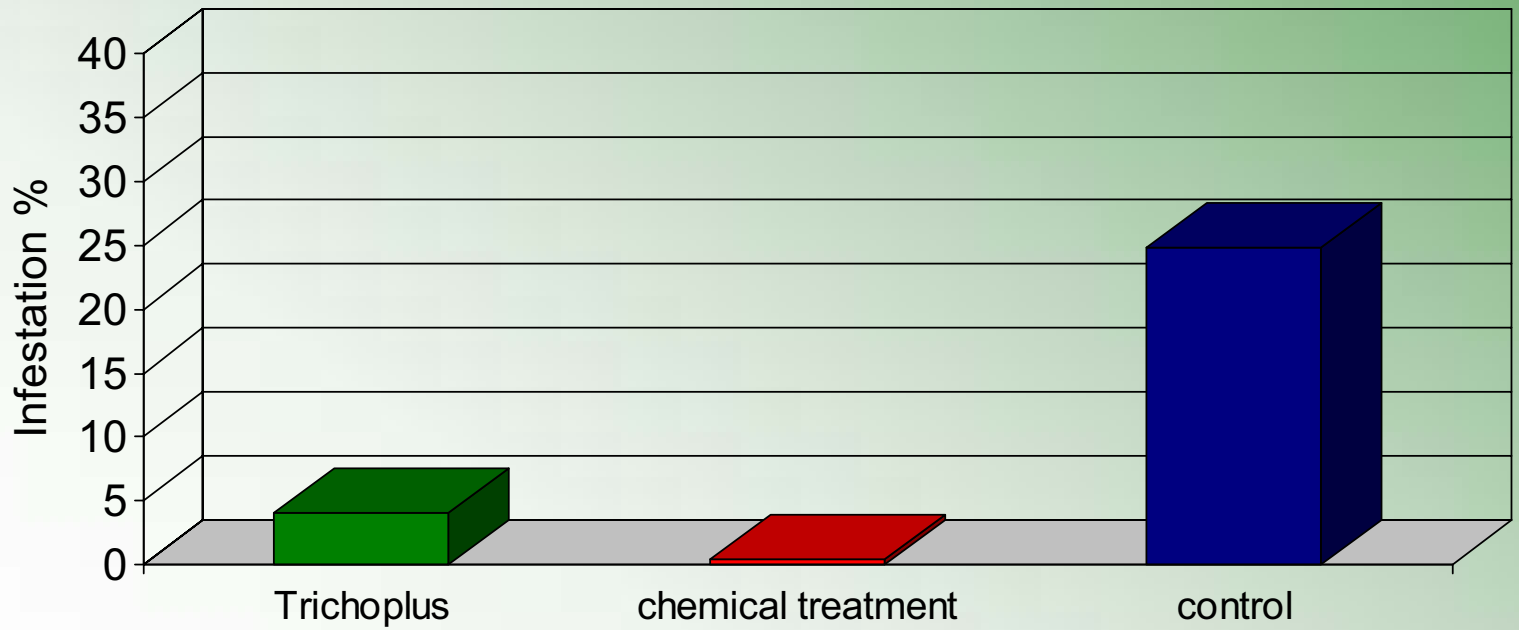
Dosage: 4 x 100 caps/ha

Evaluated sample: 4 x 50 plants

Date of evaluation: 26.08

Efficacy : Trichoplus - 83,9 %

chemical treatment - 98,4 %



Biocont Laboratory

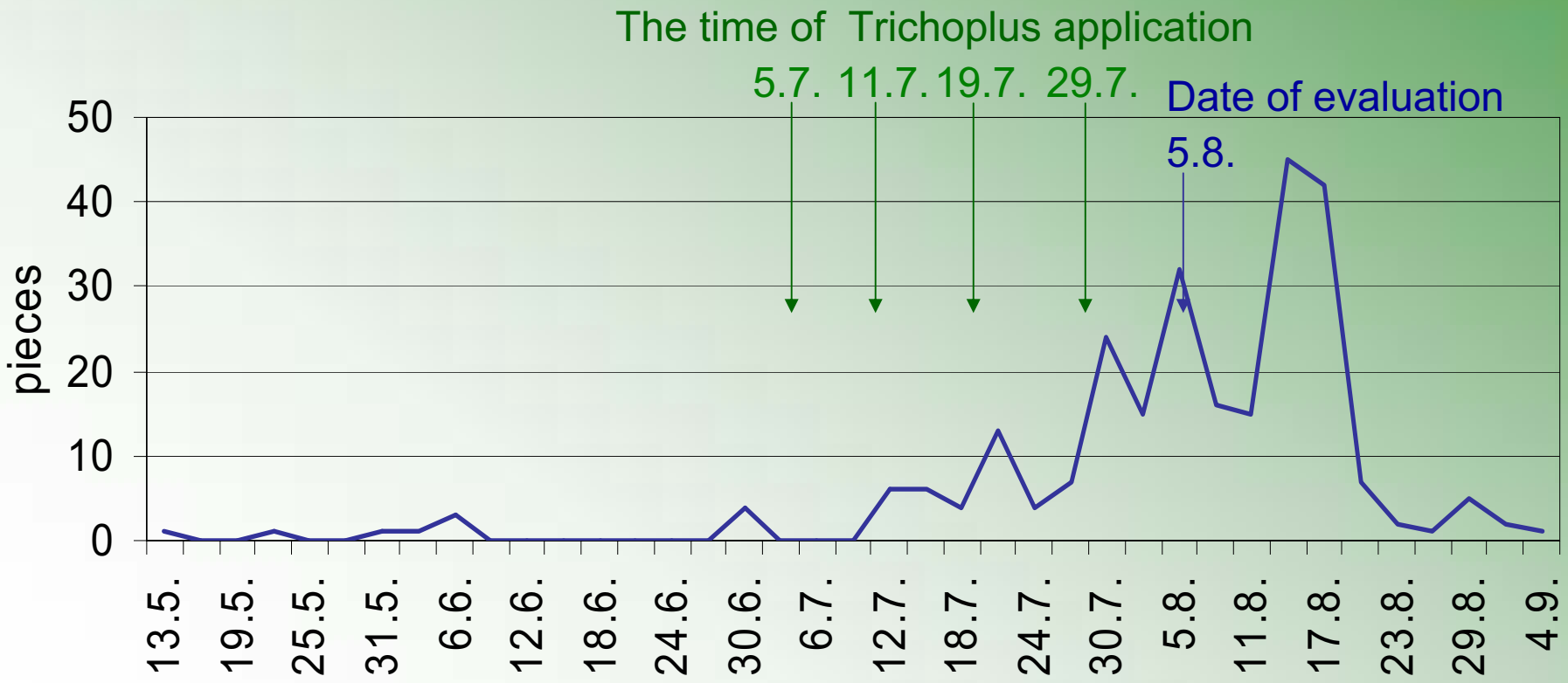
Crop: White cabbage

Locality: Győr, Hungary, 2002

Pest: Cabbage moth *(M.brassicae)*, Cabbage worm *(P.rapae)*

Date of treatment: 05.07; 11.07; 19.07; 29.07

Dosage: 4 x 100 caps / ha



Biocont Laboratory

Effect of Trichoplus on the cabbage moth in cabbage

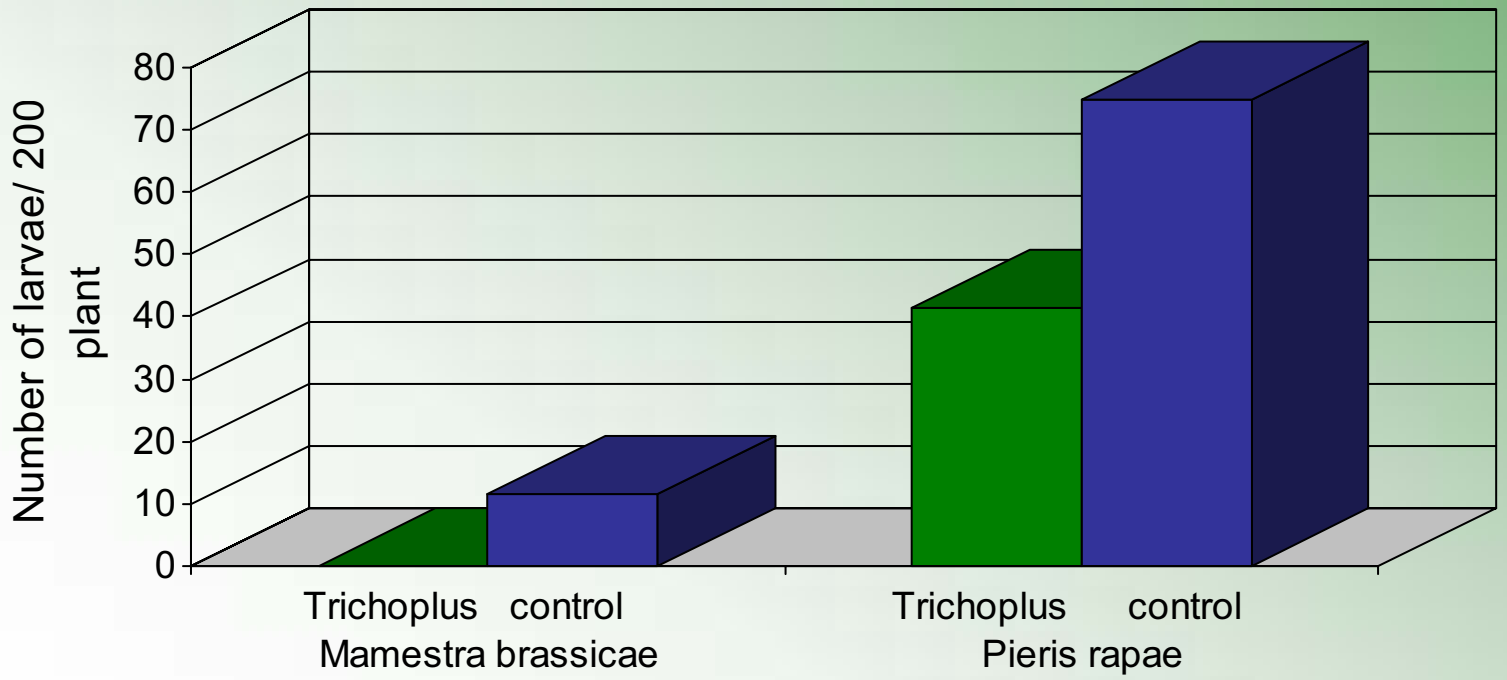
Locality: Győr, Hungary, 2002

Dosage: 4 x 100 caps/ha

Date of evaluation: 05.08.

Evaluated sample: 4 x 50 plants

Efficacy: Mamestra brassicae - 100 %
Pieris rapae - 44 %



Source SPA

Advantages of the Trichoplus® capsules

- hitch capsules on plant ensures optimal conditions during the whole hatching of Trichogramma

Advantages of the Trichoplus® capsules

- contains the biological product of the top quality
- efficient protection of beneficial wasps against adverse effect of climate and predators
- advisory support for correct timing of delivery and application is included in the price
- up to 80 % efficacy is reached provided that all recommendations for use are followed
- hitch capsules on plant ensures optimal conditions during the whole hatching of Trichogramma

Biocont Laboratory Ltd.

Šmahova 66, Brno – Slatina, 627 00
Czech Republic

Phone: +420 5 45218156
E-mail: biocont@biocont.cz
www. biocont.cz

hluchy@biocont.cz

Tab. No. 1

Crop Greenhouse – G Field - F	Locality Country Year	Dosage (specimens per hectare)	Evaluated sample	Infestation on the control (caterpillar/sample)	Infestation Trichoplus Plot (caterpillar/sample)	Infestation chemical protection (caterpillar/sample)	Efficacy Trichoplus %	Efficacy chemical protection %
Green bean F	Nagyherkály puszta HU 2002	3 x 113.000	4 x 100 pods	125	21	-	83,2	-
Tomato G	Tordas HU 2002	2 x 200.000 3 x 200.000	4 x 50 fruits 4 x 50 fruits	16 62	1 11	- -	93,8 82,3	- -
Sweet pepper G	Tordas HU 2002	2 x 200.000 3 x 200.000	4 x 50 fruits 4 x 50 fruits	33 97	2 22	- -	93,9 77,3	- -
Cabbage F	Rábakecöl HU 2002	4 x 100.000	4 x 50 plants	12	0	-	100,0	-
Cabbage F	Otice CZ 2003	4 x 150.000	4 x 50 plants	49	8	1	83,7	98,0

Tab. No. 2

Crop Greenhouse – G Field - F	Locality Country Year	Dosage (specimens per hectare)	Evaluated sample	Infestation on the control (infected/ not infected)	Infestation Trichoplus (infected/ not infected	Infestation chemical protection (infected/ not infected	Efficacy Trichoplus %	Efficacy chemical protection %
Tomato F	Vrbová/V. SK 2003	3 x 225.000 2 x 300.000	fruits on 4 x 10 plants	535/65	128/735	276/307	83,4	46,9
Sweet pepper F	Marcelov SK 2003	2 x 300.000	10 x 10 plants	116/465	50/1000	-	76,0	-

Tab. No.3

Tab. No.3

Crop Field - F	Locality Country Year	Dosage (specimens per hectare)	Evaluated sample	Infestation Trichoplus infected/not infected	Infestation chemical protection infected/not infected	Infestation Trichoplus %	Infestation chemical protection %
Tomato F	Želiezovce SK 2003	3 x 225.000 2 x 300.000	4 x 10 plants	168/1306	373/1068	11,4	25,9
Sweet pepper F	Želiezovce SK 2003	3 x 225.000 2 x 300.000	8 x 10 plants	23/708	81/492	3,1	14,1
Sweet pepper F	Marcelová SK 2003	3 x 225.000	6 x 10 plants	13/477	12/434	2,7	2,7

Tab. No.4

Crop Field - F	Locality Country Year	Dosage (specimens per hectare)	Evaluated sample	Infestation Trichoplus + Biobit infected/ not infected	Infestation Biobit infected/ not infected	Infestation chemical protection infected/ not infected	Infestation Trichoplus + Biobit %	Infestation Biobit %	Infestation chemical protection %
Tobacco F	B. Kosihy SK 2003	2 x 95.000 1 x 180.000	4 x 10 plants	0/40	7/33	34/6	0%	17,5 %	85 %

Tab. No. 5

Number of trial	Crop	Locality	Evaluated sample	Variation	Infestation (caterpillar/sample) Repetition				Statistical significance		
					1	2	3	4	90 %	95 %	99 %
1	Green bean	Nagyherkály puszta	4 x 100 pods	control	25	47	20	33	A	A	A
				Trichoplus	4	6	2	9	B	B	B
2	Tomato	Tordas	1. evaluation 4 x 50 fruits	control	4	2	6	4	A	A	A
				Trichoplus	0	0	1	0	B	B	B
			2. evaluation 4 x 50 fruits	control	16	17	14	15	A	A	A
				Trichoplus	2	4	1	4	B	B	B
3	Sweet pepper	Tordas	1. evaluation 4 x 50 fruits	control	11	7	6	9	A	A	A
				Trichoplus	0	0	2	0	B	B	B
			2. evaluation 4 x 50 fruits	control	25	19	28	25	A	A	A
				Trichoplus	4	6	5	7	B	B	B
4	Cabbage	Rábakecöl	4 x 50 plants	control	12	8	16	10	A	A	A
				Trichoplus	0	0	0	0	B	B	B

Tab. No. 6

Number of trial	Crop	Locality	Evaluated sample	Variation	Infestation (infected / not infected) Repetition										Statistical significance		
					1	2	3	4	5	6	7	8	9	10	90 %	95 %	99 %
5	Tomato	Vrbová/V.	Fruit on 10 x 1 plants	control	46/6	68/5	49/6	65/7	59/6	47/9	44/7	69/4	48/7	40/8	A	A	A
				Trichoplus	15/73	16/85	13/69	19/82	14/79	10/63	11/77	13/81	11/66	6/60	B	B	B
				chemical treatment	32/39	25/36	39/28	25/22	15/21	16/28	29/36	38/39	42/32	15/26	C	C	C
6	Sweet pepper	Marcelová	10 x 10 plants	control	22/18	7/48	12/40	15/57	8/58	15/51	9/65	6/51	6/45	16/32	A	A	A
				Trichoplus	9/54	7/118	3/108	2/83	4/71	6/131	4/134	5/103	4/96	6/102	B	B	B
7	Cabbage	Otice	4 x 50 plants	control	6/44	17/33	13/37	13/37	-	-	-	-	-	-	A	A	A
				Trichoplus	2/48	2/48	3/47	1/49	-	-	-	-	-	-	B	B	B
				chemical treatment	0/50	1/49	0/50	0/50	-	-	-	-	-	-	C	C	B
8	Tomato	Želiezovce	3 x 10 plants	Trichoplus	56/311	60/372	52/623	-	-	-	-	-	-	-	A	A	A
				chemical treatment	104/129	115/404	154/535	-	-	-	-	-	-	-	A	A	A
9	Sweet pepper	Želiezovce	8 x 10 plants	Trichoplus	1/53	4/59	7/93	3/97	4/109	0/96	1/99	3/102	-	-	A	A	A
				chemical treatment	6/92	8/67	8/56	3/45	22/28	18/63	9/70	7/71	-	-	B	B	A
10	Sweet pepper	Marcelová	6 x 10 plants	Trichoplus	2/75	3/76	1/67	3/89	3/92	1/78	-	-	-	-	A	A	A
				chemical treatment	1/73	2/79	2/87	3/92	3/69	1/34	-	-	-	-	A	A	A
11	Tobacco	B. Kosihy	4 x 10 plants	Trichoplus + Biobit	0/10	0/10	0/10	0/10	-	-	-	-	-	-	A	A	A
				Biobit	2/8	1/9	1/9	3/7	-	-	-	-	-	-	B	B	B
				chemical treatment	8/2	9/1	9/1	8/2	-	-	-	-	-	-	C	C	C